TRANSCRIPT OF RECORD

Supreme Court of the United States

OCTOBER TERM, 19[illegible]

No. 102

CORONA CORD TIRE COMPANY, PETITIONER,

vs.

DOVAN CHEMICAL CORPORATION.

ON WRIT OF CERTIORARI TO THE UNITED STATES CIRCUIT COURT OF APPEALS FOR THE NINTH CIRCUIT.

...place and results claimed indicate that they were never performed and that figures	...at the Falls Co. with the same ... celerators previously ... at Norwalk		...made by ... Carbon Co. by Harmony and Tuttle
Publication hardly noticed by rubber and chemical industries as it told nothing of commercial importance. Rubber manufacturers did not learn enough from this paper as to superiority of DPG rubber to induce them to buy DPG when DPG was offered to them at a low price. Sales of DPG in 1920—despite an aggressive sales campaign—53 pounds (R., p. 244).	Kratz's paper published, April 1st.	1920	Weiss endeavored to obtain employment by claiming he had discovered a method of making DPG and he cited the Kratz paper as showing the value of DPG as an accelerator.	Weiss left Republic Company in March and sought employment with rubber and chemical companies. Met Doty and Woodward, who tried out sample of DPG, and *immediately* accepted his proposal to organize respondent corporation for manufacture and sale of DPG. DPG offered for sale to rubber industry first in August. Total sales for 1920—53 pounds (R., pp. 244, 250 to 251).
		1921	Weiss' application filed, November 12th. 4 yrs., 2 mos. after sale of Kratz Tubes. 3 yrs., 8 mos. after Weiss alleged conception. 2 yrs., 8 mos. after Weiss alleged reduction to practice. 2 yrs., 2 mos. after Kratz's paper and after Weiss learned of Kratz's paper.	Delay immaterial so long as no statutory bar arose. Weiss during this period was busy making and selling DPG in large and ever increasing quantities, thus giving benefit of his invention to public (R., p. 246).
		1922	Weiss patent granted, March 28, 1922.	Roessler and Hasslacher paid large sum for a license under patent in suit (R., p. 260).
		1923		846,431 lbs. of DPG sold (R., p. 643).
		1924		1,018,609 lbs. of DPG sold (R., p. 643).
		1925		Approximately 2,000,000 lbs. of DPG consumed.

(32,482)

SUPREME COURT OF THE UNITED STATES

OCTOBER TERM, 1927

No. 182

CORONA CORD TIRE COMPANY, PETITIONER,

vs.

DOVAN CHEMICAL CORPORATION

ON WRIT OF CERTIORARI TO THE UNITED STATES CIRCUIT COURT OF APPEALS FOR THE THIRD CIRCUIT

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RECORD.

Among the rolls, records and judicial proceedings had in the District Court of the United States for the Western District of Pennsylvania, at No. 1109 in Equity, may be found the following words and figures, to-wit:

Docket Entries.

UNITED STATES DISTRICT COURT,
WESTERN DISTRICT OF PENNSYLVANIA.

DOVAN CHEMICAL CORPORATION, Plaintiff, vs. CORONA CORD TIRE COMPANY, Defendant.	No. 1109 In Equity. On Patent No. 1,411,231 to M. L. Weiss.

June 4, 1924 Bill of Complaint filed.

June 4, 1924 Subpoena issued.

June 12, 1924 Subpoena returned served on Corona Cord Tire Co. by handing to and leaving a true and attested copy thereof with H. B. Callahan, General Manager of said Company at Butler, Pa., June 11, 1924.

June 28, 1924 *Praccipe* for appearance of Winter, Brown & Critchlow for Defendant filed.

Aug. 7, 1924 Answer filed.

Oct. 7, 1925 Hearing on Bill. Answer and Proofs.

Feb. 3, 1926 Transcript of Arguments of Counsel filed.

Feb. 3, 1926 Opinion filed and entered.

Feb. 13, 1926 Final decree entered dismissing bill of complaint with costs to defendant to be taxed.

Mar. 10, 1926 Petition of Plaintiff for appeal filed.

Mar. 10, 1926 Assignments of Error filed.

Mar. 10, 1926 Order allowing appeal filed and entered.

Mar. 10, 1926 Bond on appeal approved and filed.

Mar. 11, 1926 Citation awarded and issued.

Mar. 13, 1926 Citation returned service accepted by Winter, Brown & Critchlow, Solicitors for Defendant.

Bill of Complaint.

Filed June 4, 1924.

To the Honorable Judges of the District Court of the United States for the Western District of Pennsylvania:

The plaintiff by this, its bill of complaint, alleges as follows:

1. That the plaintiff, Dovan Chemical Corporation, above named, is a corporation duly organized and existing under and by virtue of the laws of the State of Delaware and a citizen and resident of said State.

2. On information and belief, that the defendant, Corona Cord Tire Company, above named, is a corporation organized and existing under and by

virtue of the laws of the State of Pennsylvania, and is a resident of said State, having its principal office in East Butler, Summit Township, Butler County, Pennsylvania, in the Western District.

3. That this is a suit in equity brought under the patent laws of the United States for the infringement of the hereinafter mentioned United States Letters Patent No. 1,411,231, issued March 28, 1922.

4. On information and belief that Morris L. Weiss, on and prior to the 12th day of November, 1921, being then a citizen of the United States of America, and residing in the Borough of Brooklyn, County of Kings, State of New York, and being within the meaning of the statutes of the United States then in force the first, sole, true and original inventor of certain new and useful improvements in "Vulcanization Accelerators" and in the process of treating rubber and in the vulcanized rubber compound in which the said accelerator is used, not known or used by others in this country, and not patented or described in any printed publication in this or any foreign country before his invention or discovery thereof, or more than two years prior to his application for Letters Patent of the United States therefor, and not in public use or on sale in this country for more than two years prior to his application for Letters Patent therefor, and not having been patented in any country foreign to the United States on an application filed by him or his legal representatives or assigns for more than twelve months prior to his application for Letters Patent of the United States therefor, and no application for a patent on said improvement having been filed

by him or his representatives or assigns in any country foreign to the United States, on November 12, 1921, duly made, and on the 12th day of November, 1921, filed an application in writing with the Commissioner of Patents of the United States for Letters Patent for said invention and improvements.

5. That on March 28, 1922, all of the provisions and requirements of the statutes of the United States in such cases made and provided having been duly complied with, the said application and the said inventions and improvements or discoveries described, shown and claimed therein having been duly assigned to the plaintiff, the Dovan Chemical Corporation, a corporation of the State of Delaware, Letters Patent of the United States numbered 1,411,231 were duly issued on said application for said invention and improvements or discoveries to said Dovan Chemical Corporation, its successors or assigns, whereby there was granted to said plaintiff, its successors and assigns, for the term of seventeen years from the 28th day of March, 1922, the exclusive right to make, use and vend said inventions and improvements set forth, described and claimed therein, throughout the United States and the Territories thereof.

6. That the plaintiff asks that said Letters Patent and assignment may be deemed and taken as a part of this bill of complaint, and the plaintiff asks leave to refer to the originals or duly authenticated copies thereof, ready in court to be produced, a copy of said patent being annexed hereto.

7. That by virtue of the premises the plaintiff became and ever since the issue of said patent on the 28th day of March, 1922, has been and now

is the sole owner of the entire right, title and interest in said Letters Patent No. 1,411,231, and has been and now is entitled to sue for and collect all damages and profits for the infringement of said Letters Patent, including the infringement herein complained of.

8. That the inventions and improvements of said Letters Patent No. 1,411,231 are of great value and importance to the plaintiff; that the plaintiff and its predecessors in business have caused quantities of the vulcanization accelerator described and claimed in said patent to be manufactured and sold to the public for use in the vulcanization of rubber and rubber goods, and that the plaintiff is prepared and able to supply the demand for said invention and improvements for such purposes; that the inventions or improvements of said Letters Patent for such purposes are of great value, benefit, advantage and importance to the public, and that the public, so far as may be ascertained, since the issue of said patent, have, with one or two exceptions, generally acknowledged and acquiesced in the rights granted by said Letters Patent and the rights of the plaintiff therein and thereunder; that said Letters Patent has been specially acquiesced in by plaintiff's licensee (exclusive except as to plaintiff) which licensee well knowing the premises now acquiesces and always has acquiesced in said patent and has paid plaintiff in excess of Seventy-five Thousand Dollars ($75,000.00) as royalties thereunder; that except for the infringement herein complained of and said exceptions, the plaintiff would now be in undisputed possession, use and enjoyment of the

rights and privileges secured by said Letters Patent, and in respect of the gains and profits from the same.

9. That since the grant of said Letters Patent No. 1,411,231, containers, packages or boxes in which said vulcanization accelerator has been sold and shipped by the plaintiff and its said licensee have been marked by affixing thereon the word "Patented" together with the day and year in which said Letters Patent were granted.

10. That on information and belief, the defendant Corona Cord Tire Company, without right or license under said Letters Patent No. 1,411,231, and in violation and infringement of said Letters Patent, has, since March 28, 1922, and prior to the execution of this bill of complaint, unlawfully and wrongfully used, made, sold and offered for sale, within the United States, and is now making, selling and offering for sale within the United States, rubber and rubber products vulcanized with diphenylguanidine, employing or embodying the inventions and improvements of said Letters Patent or substantial or vital parts thereof, and thereby has infringed and contributed to the infringement by others of said Letters Patent contrary to the aforesaid rights of the plaintiff thereunder.

11. On information and belief, that the defendant herein has derived and received and will derive and receive from the infringement complained of herein, large gains, profits and advantages due to the saving in cost of manufacture of its said infringing rubber and rubber products as compared with rubber and rubber products known prior to

the invention of said Weiss as set forth and claimed in said Patent No. 1,411,231, and to the enhanced value of such rubber and rubber products to defendant and its trade by reason of the superiority thereof in material qualities required of rubber products, such as durability, tensile strength and aging, but to what amount the plaintiff is ignorant and cannot set forth; that by reason of said infringement the plaintiff has been and will be deprived and prevented from receiving, if such infringement is not forthwith restrained by this Court, all the gains and profits to which it is lawfully entitled, and which it would have derived and received and would now be deriving and receiving but for the aforesaid infringement; that by reason of the aforesaid infringement the plaintiff has been irreparably injured and has sustained damages and losses thereby; that unless said infringement by the defendant is immediately restrained by an order and writ of injunction issuing out of this Court, further and immediate irreparable injury, loss and damage will be caused to the rights of the plaintiff under said Letters Patent.

12. On information and belief, that the defendant Corona Cord Tire Company, prior to the commencement of this suit, was notified of the aforesaid rights of the plaintiff in said Letters Patent No. 1,411,231, and of the defendant's infringement and threatened infringement thereof, and warned to cease and desist from such infringement, but that the defendant failed so to do, and continues and threatens to continue said infringement of said Letters Patent.

13. On information and belief, that on or about the 1st day of April, 1920, the said inventor Morris L. Weiss called upon Messrs. Henry S. Doty and Van Lear Woodward at their office, 30 Church Street, New York City, and also disclosed said invention to them, and offered and extended to them the opportunity and option of obtaining rights under said invention of said Morris L. Weiss; that after due consideration of said offer, the same was accepted by said Henry S. Doty and Van Lear Woodward, and subsequent thereto, on or about the 3rd day of February, 1921, the plaintiff corporation was organized under the laws of the State of Delaware for the purpose of manufacturing, selling and dealing in vulcanization accelerators, to wit, diphenylguanidine manufactured in accordance with the description and claims of said Letters Patent No. 1,411,231.

14. Upon information and belief, that, pursuant to the organization of said Dovan Chemical Corporation, plaintiff herein, a factory and manufacturing plant was obtained in the borough of Brooklyn, County of Kings, State of New York, for the manufacture of said diphenylguanidine as an accelerator for use in the vulcanization of rubber; that thereafter the plaintiff, through its selling agents, first placed said vulcanization accelerator on the market, and through an active selling campaign established a large and growing demand for the same, which demand was satisfied until the destruction of its said factory by fire on or about the 8th day of September, 1921; that thereafter, with all reasonable speed and diligence, the plaintiff obtained and equipped another manufacturing plant at North Newark,

County of Essex, State of New Jersey, and upon the completion of the same, on or about the 1st day of January, 1922, immediately resumed the manufacture of said vulcanization accelerator, and together with its said licensee has since continued to manufacture and supply same for the vulcanization of rubber in large and increasing quantities.

Therefore, the plaintiff prays:

I. That a process of subpoena issued out of and under the seal of this Court requiring the said defendant to appear and make full, true, direct and perfect answer to the several matters and things set forth and charged in this bill of complaint (but not under oath, an answer under oath being expressly waived).

II. That the defendant, its associates, attorneys, officers, directors, clerks, servants, agents, workmen and employees be perpetually enjoined and restrained by the decree of this Court from directly or indirectly making or causing to be made, using or causing to be used, selling or causing to be sold, advertising or offering for sale or use, or causing to be advertised, offered for sale or use, agreeing or contracting to sell, or causing to be agreed, contracted for sale, supplying or causing to be supplied, or using or disposing of in any manner, any vulcanization accelerator or vulcanized rubber embodying or employing said inventions and improvements or discoveries of said Letters Patent No. 1,411,231, or any substantial, material or vital part or parts thereof, and from infringing upon or contributing to the infringement of said Letters Patent in any way whatsoever.

III. That a provisional or preliminary injunction or restraining order may be immediately issued

against the said defendant to the same tenor and effect as hereinbefore prayed for in respect to said perpetual injunction.

IV. That the defendant be ordered and decreed to deliver to the plaintiff any and all quantities of disubstituted guanidines and particularly diphenylguanidine, or rubber vulcanized therewith which it has in its possession or under its control, or that same may be destroyed, or that same be delivered to or be impounded by the Court for such final disposition as may seem just and proper.

V. That the defendant may be decreed to account for all such gains, profits, savings, and advantages as have accrued to or been earned or received by it, and all damages it has caused the plaintiff by reason of said infringement, and that the Court will assess the same or cause them to be assessed under its direction, and will increase the same in its discretion as provided by law.

VI. That the defendant may be decreed to pay the costs, charges and disbursements of this suit, and that the plaintiff may have such other and further relief as the circumstances and the equity of the case may require.

DOVAN CHEMICAL CORPORATION,
By H. S. DOTY,
Pres.

BAKEWELL, BYRNES & STEBBINS,
Solicitors for Plaintiff.
J. S. WOOSTER,
J. J. KENNEDY,
Of Counsel.
1717 Farmers Bank Bldg.

State of New York,
County of New York, } *ss:*

On this 29th day of May, 1924, before me came Henry S. Doty, to me personally known, who, being by me duly sworn, did depose and say that he is the President of the Dovan Chemical Corporation, the plaintiff named in the foregoing bill of complaint; that he has read said bill subscribed by him and knows the contents thereof, and that the same is true of his own knowledge, except as to matters which are therein stated to be alleged upon information and belief, and as to those matters he believes it to be true; that the reason why this verification is not made by the plaintiff personally is that said plaintiff is a corporation.

LULU C. ECKERT;
Notary Public.

[NOTARY SEAL]

Notary Public, Queens Co. No. 1584. Cert. filed in N. Y. Co. No. 621, Reg. 6121. Term expires Mar. 30, 1926.

Defendant's Answer.

(Filed Aug. 7, 1924.)

And now comes the defendant in the above entitled case and answering the Bill of Complaint herein, says:

1. Defendant does not know, has not been informed save by the Bill of Complaint, and therefore denies that the plaintiff is a corporation organized and existing under the laws of the State of Delaware and a citizen and resident of said State.

2. Defendant admits that it is a corporation organized and existing under the laws of the State of Pennsylvania and a resident of said State, having its principal office as alleged in the Bill of Complaint.

3. Defendant admits that on March 28, 1922, Letters Patent of the United States No. 1,411,231 were granted to Dovan Chemical Corporation, of Wilmington, Delaware, a corporation of Delaware as alleged assignee of Morris L. Weiss of Brooklyn, New York. But the defendant denies that Morris L. Weiss, a citizen of the United States of America, residing in Brooklyn, New York, was, prior to the 12th day of November, 1921, or at any other time, the first, sole, true and original inventor of certain new and useful improvements in vulcanization accelerators or any process of treating rubber or in a vulcanized rubber compound in which an accelerator is used; denies that the said alleged improvements were not known or used by others in this country and not patented or described in any printed publication in this or any foreign country before his alleged invention or discovery thereof, or more than two years prior to the filing of his application for Letters Patent of the United States therefor, and not in public use or on sale in this country for more than two years prior to the filing of his said application for Letters Patent therefor and not patented in any country foreign to the United States on an application filed by said Weiss or his legal representatives or assigns more than twelve months prior to his application for Letters Patent of the United States therefor, and that no application for a patent on said improvement had been filed by said Weiss or his representatives or assigns

in any country foreign to the United States; denies that on November 12, 1921, said Weiss duly made or on the 12th day of November, 1921, filed, an application for Letters Patent of the United States for said invention or improvement; denies that all of the provisions and requirements of the Statutes of the United States in such cases made and provided were duly complied with by the said Weiss; denies that the said application for the alleged inventions and improvements and discovery described, shown and claimed therein were duly assigned to the plaintiff; denies that said Letters Patent No. 1,411,231 were duly issued on said application and that the plaintiff was granted by said Letters Patent the exclusive right to make, use and vend the alleged inventions and improvements set forth, described and claimed in said Letters Patent throughout the United States and territories thereof; and the defendant denies each and every allegation contained in paragraphs 4 and 5 of the Bill of Complaint and not herein and hereby specifically admitted.

4. The defendant does not know, has not been informed save by the Bill of Complaint and therefore denies that by virtue of the premises referred to in the Bill of Complaint or otherwise the plaintiff became and ever since the issue of said patent on March 28, 1922, has been and now is the sole owner of the entire or any right, title and interest in said Letters Patent No. 1,411,231 and has been and now is entitled to sue for and collect all or any damages and profits for the infringement of said Letters Patent; and the defendant denies each and every allegation contained in paragraph 7 of the Bill of Complaint.

5. Defendant does not know, has not been informed save by the Bill of Complaint and therefore denies that the inventions and improvements of said Letters Patent No. 1,411,231 are of great or any value and importance to the plaintiff or that the plaintiff and its predecessor in business have caused quantities of the vulcanization accelerator described and claimed in said patent to be manufactured and sold to the public for use in the vulcanization of rubber and rubber goods, or that the plaintiff is prepared and able to supply the demand for said alleged inventions and improvements for such purposes or that the alleged inventions or improvements of said Letters Patent for such purposes are of great value, benefit, advantage and importance to the public, and that the public since the issue of said patent have with one or two exceptions generally accepted and acquiesced in the rights granted by said Letters Patent and the alleged rights of the plaintiff therein and thereunder; or that said Letters Patent have been especially acquiesced in by the plaintiff's licensee (exclusive except to plaintiff) which licensee well knowing the premises now acquiesces and always has acquiesced in said patent and has paid plaintiff in excess of Seventy-Five Thousand Dollars ($75,000) as royalties thereunder; or that except for the alleged infringement complained of and said exceptions the plaintiff would now be in undisputed possession, use and enjoyment of the alleged rights and privileges secured by said Letters Patent and in respect of the gains and profits from the same; and this defendant denies each and every allegation contained in paragraph 8 of the Bill of Complaint and states the fact to be that since the

grant of said Letters Patent No. 1,411,231 on March 28, 1922, the claims of the plaintiff thereunder have been generally disputed and defied throughout the portions of the rubber and chemical industries of the United States interested in the use of rubber accelerators and that in fact the plaintiff heretofore brought suit for alleged infringement of said Letters Patent and that thereupon said Letters Patent were judicially determined by the United States Circuit Court of Appeals for the Second Circuit to be invalid and void in the case entitled *Dovan Chemical Corporation vs. National Analine & Chemical Co.,* reported 292 Fed. Rep., 555.

6. The defendant does not know and has not been informed save by the Bill of Complaint as to any of the matters and things alleged in paragraph 9 of the Bill of Complaint and therefore denies each and every allegation contained in said paragraph 9 of said Bill of Complaint.

7. Defendant denies that it has infringed upon said Letters Patent No. 1,411,231 and specifically denies that since March 28, 1922, and prior to the execution of the Bill of Complaint herein it has unlawfully and wrongfully or otherwise without right or license under said patent or in violation and infringement thereof used, made, sold, and offered for sale within the United States and is now making, selling and offering for sale within the United States rubber and rubber products vulcanized with diphenylguanidine employing or embodying the alleged invention and improvements of said Letters Patent or substantial or vital parts thereof and has thereby infringed or contributed to the infringement by others of said Letters

Patent contrary to any rights of the plaintiff thereunder; and the defendant denies each and every allegation contained in paragraph 10 of the Bill of Complaint.

8. The defendant denies each and every allegation contained in paragraph 11 of the Bill of Complaint.

9. Defendant admits that prior to the commencement of this suit it was notified of the alleged rights of the plaintiff in said Letters Patent No. 1,411,231 and of the alleged infringement and threatened infringement thereof and warned to cease and desist from such alleged infringement; but the defendant denies each and every allegation of paragraph 12 of the Bill of Complaint not herein and hereby specifically admitted and states the fact to be that due consideration of the alleged invention and improvement described and claimed in said Letters Patent No. 1,411,231 referred to in said paragraph 12 of the Bill of Complaint led the defendant to the conviction that said Letters Patent were in all respects invalid and were considered to be invalid by those interested in the manufacture, sale and use of rubber accelerators and that upon investigation the defendant learned that said Letters patent had been judicially determined to be invalid and void by the United States Circuit Court of Appeals for the Second Circuit in the suit entitled *Dovan Chemical Corporation vs. National Analine & Chemical Co. Inc.,* reported 292 Fed. Rep., 555.

10. The defendant does not know and has not been informed save by the Bill of Complaint as to any of the matters and things alleged in paragraphs

13 and 14 of the Bill of Complaint, and therefore denies each and every allegation contained in said paragraphs 13 and 14 of the Bill of Complaint.

11. Defendant avers that said Letters Patent No. 1,411,231 were and are invalid and void because the alleged invention or inventions purporting to be patented thereby did not constitute patentable knowledge or invention within the meaning of the Patent Law in view of the prior state of the art and in view of what was common knowledge on the part of those skilled in the art at or prior to the date of the said alleged invention of the subject matter of the said Letters Patent by the said Morris L. Weiss.

12. Defendant further avers that long prior to the filing by the said Morris L. Weiss of the application for the said Letters Patent No. 1,411,231, and long prior to the presentation or announcement by the said Weiss of any claim that he was the first to discover or suggest that diphenylguanidine possessed any utility as a rubber accelerator, the value and utility of diphenylguanidine as a rubber accelerator had been publicly announced to those most interested in the use of rubber accelerators and knowledge thereof had been spread broadcast among chemists and manufacturers of rubber goods interested in the use of rubber accelerators, but no claim was made by the said Weiss or by any one in his behalf at that time or at any time thereafter for a long period of time that he the said Weiss, had been the first to appreciate the value of diphenylguanidine as a rubber accelerator or had conceived the idea of so using it at any time prior to the said announcement; furthermore, at various times thereafter, the use of diphenylguan-

idine as a rubber accelerator and the announcement of its value as a rubber accelerator, were discussed by the said Morris L. Weiss under conditions such that, had he then claimed to be the inventor of diphenylguanidine as a rubber accelerator, or to have been the first to suggest the use of diphenylguanidine as a rubber accelerator, he should have so stated, but nevertheless, while the said Weiss did claim that he had invented a process of making diphenylguanidine, at no time did he claim or suggest that he was the inventor or the first to suggest the use of diphenylguanidine as an accelerator; wherefore defendant avers that the said Weiss and the plaintiff herein are estopped from asserting that the said Letters Patent No. 1,411,231 are valid, that the said Weiss is the inventor of any inventions or improvements described in said Letters Patent or that the said Weiss was the first to conceive or to propose the use of or to use diphenylguanidine as a rubber acceleator.

13. Defendant avers that said Letters Patent No. 1,411,231 were and are invalid and void because the alleged invention and discoveries described and claimed therein, or all material and substantial parts thereof had been, prior to the alleged invention and discovery thereof by the said Morris L. Weiss, patented, described and published in the following Letters Patent, to wit:

U. S. Patent No. 1,159,257 to Georges North, granted Nov. 2, 1915.

U. S. Patent No. 1,159,258 to Georges North, granted Nov. 2, 1915.

U. S. Patent No. 1,371,662 to Clayton W. Bedford, granted Mar. 15, 1921 (appln. filed Jan. 6, 1917).

English Patent No. 130,857 of 1919 to North British Rubber Co.

French Patent No. 492,140 to The Goodyear Tire & Rubber Company. Pub. June 28, 1919.

and also in other United States and foreign Letters Patent now unknown to defendant, but which when known defendant prays leave by proper amendment to insert in this answer.

14. Defendant avers that said Letters Patent No. 1,411,231 were and are invalid and void because the alleged invention and discovery described and claimed therein, and all material and substantial parts thereof, had been, prior to the alleged invention and discovery thereof by the said Morris L. Weiss, or more than two years prior to his application for said Letters Patent, described and published in the following printed publication, to wit:

Chemical & Metallurgical Engineering, Oct. 1, 1919, Vol. 21, No. 7, page 430.

Journal of Industrial and Engineering Chemistry, April, 1920, Vol. 12, No. 4, pp. 317-324.

Journal of Industrial and Engineering Chemistry, February, 1921, p. 125.

India Rubber World, May 1, 1921, p. 572.

Indiana Rubber World, Nov. 1, 1919, pp. 80-81.

Le Caoutchouc et Gutta-percha, July 15, 1919, pp. 9853, 9858, 9860-9864.

Le Caoutchouc et Gutta-percha, Sept. 15, 1918, No. 175, pp. 9609-9611, 9637-9638.

Le Caoutchouc et Gutta-percha, Nov. 15, 1919, Vol. 16, No. 189, p. 10050, p. 10051.

Le Caoutchouc et Gutta-percha, ..., 1921, Vol. 18, p. 11009.

and in various other publications now unknown to this defendant but which when known defendant prays leave by proper amendment to insert in this answer.

15. Defendant avers that said Letters Patent No. 1,411,231 were and are invalid and void because the said Morris L. Weiss was not the original and first inventor or discoverer of the alleged invention or inventions purporting to be patented in and by said Letters Patent but that the same and every material part thereof were, prior to the alleged invention thereof by the said Morris L. Weiss, invented, if there be any patentable invention therein, by or known to and used by the following named persons at the places set opposite their respective names, such persons now residing, to the best of defendant's knowledge and belief, at the places stated:

Carl H. Eaton, of Youngstown, Ohio, at Youngstown, Ohio.

George D. Kratz, of Cuyahoga Falls, Ohio, at Norwalk, Connecticut and Cuyahoga Falls, Ohio.

A. H. Flower of Cuyahoga Falls, Ohio, at Cuyahoga Falls, Ohio.

The Falls Rubber Company, Cuyahoga Falls, Ohio.

Cole Coolidge of Columbus, Ohio, at Cuyahoga Falls, Ohio.

Ralph W. Baldwin, Youngstown, Ohio.

Republic Rubber Co., Youngstown, Ohio

and by other persons whose names and residences are not at present known to defendant but which, when ascertained, it prays leave by proper amendment to insert in this answer.

16. Defendant avers that at the time of filing the application for the said Letters Patent No. 1,411,231, and during the pendency thereof in the United States Patent Office, the said Morris L. Weiss misrepresented and made false and misleading presentations of his alleged invention and of alleged facts in connection therewith to the Commissioner of Patents with intent to surreptitiously and unjustly procure the grant of and acquire the said Letters Patent and that the said Letters Patent No. 1,411,231 are therefore invalid and void.

WHEREFORE, defendant prays that the Bill of Complaint be dismissed with costs.

PENNIE, DAVIS, MARVIN & EDMONDS,
Solicitors for Defendant.

DEAN S. EDMONDS,
Of Counsel.

RECORD.

IN THE
DISTRICT COURT OF THE UNITED STATES
FOR THE WESTERN DISTRICT OF PENNSYLVANIA.

DOVAN CHEMICAL CORPORATION,
Plaintiff,
vs.
CORONA CORD TIRE COMPANY,
Defendant.

In Equity,
No. 1109.

And now, Wednesday, October 7, 1925, the above cause came on to be heard before Hon. ROBERT M. GIBSON, J., at Pittsburgh, Pa.

APPEARANCES:
J. J. KENNEDY, Esq.,
J. S. WOOSTER, Esq.,
Messrs. BYRNES, STEBBINS & PARMELEE,
For Plaintiff.
DEAN S. EDMONDS, Esq.,
FRANK E. BARROWS, Esq.,
Messrs. WINTER, BROWN & CRITCHLOW,
For Defendant.

Opening Statement of Plaintiff.

By Mr. Kennedy:

This is a patent suit, and the charge in the Bill is infringement of the patent, and the prayer of the Bill is for the usual injunctive relief and also for the recovery of damages and profits.

The plaintiff is a New York corporation, and the defendant is a corporation of Pennsylvania, doing business at East Butler, where it manufactures and sells tires for automobiles and possibly other products.

I will make a brief statement concerning the invention of the patent in suit. I would like to make a statement which I think will be useful to the Court, for the purpose of making it clear, as to just what the status of this patent is in the rubber industry. In most developed industries there are various ways of doing different things, and various ways of doing the same thing. That is true of the rubber industry, as it is other industries. In some of those developed arts we now and then run across a patent which is so broad and of such a pioneer character that it dominates the whole field; in other words, it includes within its monopoly all of the various ways of doing a certain thing. On the other hand, and very frequently, we run across patents that are limited to some specific way of doing some specific thing. Now, this patent that I am going to briefly describe to your Honor at present, is in between those two kinds of patents. In other words, it relates to a certain field which it created itself, and beyond which it does

not go, but in which it includes everything that probably belongs in that field. So, that so far as the rubber industry, and so far as it is concerned with things like those described in this patent, it is not affected by this patent to the extent of being prevented from doing things for say the same general purpose as the things in this patent are designed to do.

This patent, as I say, relates to rubber compounds and to processes of producing them. It has to do primarily with the vulcanizing of compounds, and therefore, with hard and semi-hard products. The vulcanizing of rubber began, according to my information, about eighty years ago, and the only vulcanizing agent then was sulphur. The vulcanizing agent today is sulphur. In other words, the vulcanizing agent in the rubber industry for producing hard or semi-hard rubber products, has throughout those eighty years been sulphur. Now, in the vulcanization of rubber compounds, a substantial amount of time is consumed. When I say "substantial", I mean from the point of view of the manufacturer, to whom the time consumed in operation is of course a very important element. Some ten years ago, or thereabouts, the manufacturers and others skilled in the rubber art turned their attention towards the acceleration or speeding up of this vulcanizing process. That was, I believe, the result to some extent, but not the entire extent, of the extension in rubber manufacture to the production of tires for automobiles, which, as your Honor probably knows, wear out rather rapidly, and often too rapidly. So that there is a constant big demand for rubber tires and has been for several years past. So that, so far as rubber tires are concerned, this is

true also as to other things—the element of time in vulcanization was important. Now, prior to the time that the patentee here made the invention covered by this patent, others had produced and there were used, and there are used now, what are known as accelerators, that is to say, something added to the rubber compound which had the effect of hastening or shortening the period of vulcanization. At that time, that is to say, prior to the invention of the patent here, there was a substance known as triphenylguanidine, and there were others, but I refer to that particularly because it is referred to specifically in the patent in suit. Now, these chemists and others who turned their attention towards these accelerators, had not simply the problem of acceleration to solve, but in solving it had also to see to it that in employing something for the purpose of acceleration they did not impair the quality of the product. In other words, you have rubber products of a certain design, or require a certain quality, and you want to hasten the time of vulcanization, and therefore the time of production, and therefore cheapen the cost, it will not do merely to have something that will accelerate, because you might have something which, while it did accelerate, would impair the quality of the product. I go into that because it is necessary for me to do so in order to make the situation clear, or at least as clear as I can, to your Honor before we start in with the trial of his case.

Now, about 1918 the inventor of the patent here in suit, entered the field then and thereafter made experiments, not simply for the purpose of producing an accelerator, because they were known, but for the

purpose of improving rubber products, and in doing so used something which would also accelerate the process of vulcanization. He experimented in 1918 with a large number of different things that occurred to him, as in the case with any chemist, and he finally hit upon the subject matter of this patent, which I will presently describe. Those experiments or tests of his resulted in the adoption by him as the best thing for his purposes, the improvement of the product and acceleration of vulcanization. Certain substances that accelerated are present in his patent, to which I will presently refer. Before referring, however, to his patent, and what is described in it, I should add that as early as the early part of 1919, this patentee had reached the point in his tests and experiments, which had extended over months, where he was satisfied and certain that this material of his would not only answer his purposes but were better than other material in the way of accelerators then on the market. He was then working for the Republic Rubber Works of Youngstown, Ohio, working there on a salary. I might say his age now is thirty-eight; then it was thirty-one or thirty. He had a wife and I believe a child, and was working simply for his salary. The Republic Works went out of business because of financial difficulties, and as a result, this man lost his job, having no means of support and having respossibilities in the way of a wife and child. He endeavored to get others interested in his invention, and in the effort to so interest them, he naturally first visited the rubber manufacturers, that is to say, some manufacturers who manufactured all kinds of rubber articles. He did not meet with any success

there, and then in the spring of 1920 he went to New York and approached a different class of prospects, namely, manufacturing chemists. The reason or one reason for his failure to interest rubber manufacturers probably was that if they took up this invention of his it would necessitate the installation of a plant by them for its manufacture. Probably also that was the reason for going to manufacturing chemists, with the idea that if he could get them interested then his material would be manufactured by these manufacturing chemists and be available to the rubber manufacturer, who therefore would not have the necessity of having to have an equipment for its manufacture. Now, his problem was not concerned simply with the discovery of this accelerator. I use that term for brevity. He was also concerned with the development of a process for the manufacture of this material. There were at the time when he was investigating and testing these different things that occurred to him, no laboratory methods for manufacturing this material. He spent a great deal of time, and profitably, I believe, so far as results were concerned, in the development of a practical quantity and a process for the manufacture of this material. When he came from New York—I should have said that after trying several of those manufacturing chemists, he wound up with the gentlemen who are here present, Mr. Woodward and Mr. Doty, and interested them and showed them that he had what he pretended to have, and going ahead with the manufacture and sale of this material. I am not referring here to this statement, and I shall not refer to it. It will not be a matter of proof. In other words, I am not indulging

in anything in the shape of argument, but am making a statement of things which we expect to prove here. Woodward and Doty took this up under an arrangement with the patentee, which has continued down to the present time. So that, although the patent is now owned by the plaintiff here, which is a corporation, the personnel of that corporation, so far as a large ownership of stock is concerned, includes not only Woodward but also this patentee Weiss.

Now, coming to the patent itself. What Weiss discovered and had a conception of in 1918, and perfected in the early part of 1919, so far as demonstration of its utility for his purpose is concerned, was that di-substituted guanidines of a certain kind or class, of which diphenylguanidine is a member or type, would be useful and were useful, not only for the improvement of the product but also in the acceleration of its vulcanization. In referring to these diguanidines, and more particularly the representative diguanidines, he, for the purpose of making it clear as to what he had accomplished, referred, for the purpose of comparison, to triphenylguanidine, which was then a known accelerator, and he says in the patent as to the result of the use of diphenylguanidine, the following:

> "I have found that diphenylguandine is much more powerful and efficacious as an accelerator in vulcanization than triphenylguanidine. For example, in the vulcanization of hard rubber articles the use of diphenylguanidine not only hastens the vulcanizating action but results in a final product much superior in texture, strength, durability and aging qualities over that when the

triphenylguandine is used. A greatly improved product also results when diphenylguanidine is used as an accelerator in the vulcanization of soft rubber compounds, particularly as regards elasticity, aging qualities and freedom from 'bloom'. In these and similar instances, it has been found that the use of triphenylguanidine requires from two to three times as long a period in vulcanizing as when diphenylguanidine is used, particularly at lower heat or steam pressure than those commonly employed."

What is his statement in the specification of the patent? It is, as I understand it, based not only upon the personal observation of Weiss himself, but upon the experiences of others actually engaged in the manufacture of rubber compounds and rubber products in the production of which was used an accelerator. Now this patent, like most other patents, has a number of claims, and the courts have so frequently referred in a critical way, and properly so, to the unnecessary number of claims, that we, for the purpose of simplifying this case for the Court and also for counsel, and in so simplifying it and endeavoring so far as plaintiff is concerned and as to that, the defendant may speak for itself—notified defendant's counsel that so far as reference to the particular claims is concerned, in the trial of this suit, we would refer to and consider in our proofs only Claims 5 and 8, which delate to the process of the patent, and Claims 9 and 12, which relate to the product of rubber compounds. The consideration of those claims will render unnecessary a consideration of other

claims, and therefore, consideration of those claims by the plaintiff and by the defendant will be all that is necessary, from my point of view, for the purpose of this trial, which would be fair to both parties.

Now, as to the question of infringement, counsel for defendant has entered into the usual stipulation, in which in this particular case it is stipulated that the defendant has used rubber compounds containing diphenylguanidine, which is, as I have stated before, the preferred accelerator, so-called, in the Weiss patent in suit, and as I have also stated before, an example or representative of the group of accelerators more generally stated in the patent or named in the patent, is di-substituted guanidine. The phenyl in diphenylguanidine is one radical quality, and the diphenyl represents the substitution of two phenyl radicals for two hydrogen elements of guanidine. Now, in the case of other radicals, the name would be di-something else, so the di-substitutes include diphenylguanidines and other guanidines which it is not necessary to name here.

Now, this patent was in litigation between this plaintiff and the National Aniline Company, and that case was tried in the United States District Court for the Southern District of New York, before his Honor, Judge Manton, who was then a Circuit Judge but at that time sat in the District Court. He decided in favor of the patentee, and also in favor of the plaintiff, on the issue of infringement. An appeal was taken by the defendant to the United States Circuit Court of Appeals and heard by Circuit Judges Rogers and Hough and Mayer. In the course of time an opinion was handed down by Judge Hough, in which

Judge Rogers concurred, holding that there was no invention in the patent in suit, but Judge Mayer dissented from that opinion. So that we are here before your Honor with a decision in one court in our favor by a Circuit Judge sitting in the District Court, and a decision against us by the majority in the Court of Appeals, and also in the position of having decisions in our favor by two Circuit Judges, namely, Judge Manton and Judge Mayer, and a decision against us by two other Circuit Judges, Rogers and Hough. Judge Hough, who wrote the opinion—I say this with the utmost respect and great admiration for Judge Hough—was mistaken in his views of the situation as presented by the testimony in that case. Possibly he was not to blame for that, and no doubt he was not, but I should hestitate to come before your Honor with this case, if the testimony in it was going to be the same as that in the National Aniline case, because I realize that while the decision in that case by the Appellate Court, while it may be persuasive, is not conclusive upon this Court, still, the disposition of the Court under the rule of county would be to follow that decision, if the facts here were the same as then; but we will have testimony here, some of which I have referred to, connected mainly with the tests, researches and investigation of this man Weiss before he finally made his invention, which was not before the Court in the National Aniline case, or, if before it at all, was only before it in the most general way, without any proper presentation as to detail. In that respect, and in others, the record here for the plaintiff will be radically, materially, different from that before the Court in the National Aninline case, and

such that if it had been before the Court, it would undoubtedly have led to a different decision.

That is all, your Honor, that I think it is necessary to say.

Just one thing I neglected to refer to and what we intend to prove in our case. I did not finish my story as to the history of this invention, because I omitted to say that after Weiss had associated himself with Woodward and Doty, they began, as soon as they could make an impression upon the trade, to manufacture and sell this material, and that since then they have built up a large and growing business in dollars and cents. Also, I believe the testimony will show that one of the biggest manufacturing chemists in the United States, has taken a license under that patent and under that license has paid thousands of dollars.

PLAINTIFF'S CASE.

By Mr. Wooster:

We offer in evidence a stipulation as to the facts of ownership of the patent, the incorporation of the plaintiff and the defendant, and the use by the defendant of diphenylguanidine, a copy of which is as follows:

> "It is hereby stipulated and agreed by the parties hereto, by their respective counsel, as follows:
>
> The Weiss patent, No. 1,411,231, of which infringement is charged in this suit, is the patent of which infringement was claimed in a suit in

the United States District Court for the Southern District of New York, brought by this plaintiff, Dovan Chemical Corporation, against National Aniline & Chemical Co., Inc. That suit was tried in open court before Circuit Judge Manton in January, 1923, and resulted in a decree sustaining the patent and holding it to have been infringed. On appeal decided in July, 1923, said decree was reversed by majority decision of the United States Circuit Court of Appeals for the Second Circuit, whose opinion is recorded in 292 Fed. Rep. 555, Circuit Judge Mayer dissenting therefrom without opinion.

As counsel for the parties to this suit wish to introduce in this suit many matters which were introduced in the National Aniline suit, this stipulation respecting a stipulation respecting a portion of defendant's case are entered into for the purpose of saving the time and expense incident to the introduction of formal proof.

Printed copies of United States and foreign patents, including dates printed thereon, and photographic copies prepared from such printed copies, may be offered by either party and shall be received in evidence with the same force and effect as the originals thereof, subject to correction should error appear.

It is conceded by defendant that the parties to this suit are corporations, as alleged in the bill of complaint; that plaintiff is and has been since its issue the owner of the patent in suit; and that subsequent to March 28, 1922, and prior to the filing of the bill of complaint herein, defendant

purchased diphenylguanidine for its own use, and used it at its place of business at East Butler, Pennsylvania, in the proportion of close to 2/3 of 1% on the rubber, as an accelerator in the vulcanization of rubber, the vulcanizing agent being sulphur, and sold rubber products including tire casings so vulcanized.

Plaintiff states that at the trial of this cause it will rely on all claims of the Weiss patent in suit but will only particularly refer to Claims 5, 8, 9 and 12 thereof.

Dated June 3, 1925.

(Signed) J. S. WOOSTER,
Counsel for Plaintiff.

PENNIE, DAVIS, MARVIN & DAVIS,
Counsel for Defendant."

Plaintiff's Testimony.

DR. GEORGE STAFFORD WHITBY, a witness called on behalf of the plaintiff, having been duly sworn, testified as follows:

By Mr. Wooster:

I offer in evidence a printed copy of U. S. Patent to Weiss, No. 1,411,231, issued March 28, 1922, to the Dovan Chemical Corporation, and I ask that the same be marked Plaintiff's Exhibit No. 1, Patent in Suit.

DIRECT EXAMINATION.

By Mr. Wooster:

1. Q. Will you please state your name, age, residence and occupation?

A. George Stafford Whitby, age thirty-eight, residence Montreal, Canada; Professor of Organic Chemistry at McGill University.

2. Q. Please state what your education and experience has been, qualifying you to testify in relation to chemical subjects, and particularly subjects relating to the qualities, compounding, vulcanizing and testing of rubber.

By Mr. Edmonds:

We will concede that Dr. Whitby is qualified to testify here, although I would like to have a brief specification of his connections, and so forth.

A. My educational qualifications are: For a time an associate of the Royal College of Science, London, England; Bachelor of Science with class honors in Chemistry, University of London; Doctor of Philosophy with the silver medal for research work in ; a Fellow of the Royal Society of Canada. I have been engaged in rubber research, industrial and scientific, continuously for the past fifteen years; for seven years as chief chemist to a large group of rubber-producing companies, and subsequently have been considerably engaged in rubber consulting work. I have published some twenty or twenty-five scientific articles dealing with rubber, several of them on the subject of accelerators. I am the author of a book entitled "Plantation Rubber and the Testing of Rubber," and am a member of the Committee of Chemists of the National Research Council of Canada. I am a member of the Crude Rubber Testing Committee of the American Chemical Society, and editor of the Rubber Section

of the International Critical Tables, published by the National Research Council at Washington.

3. Q. Are you at present on the staff retained by any organizations or companies having to do with rubber chemicals or rubber manufacture?

A. Yes. I am consulting chemist for one of the largest rubber manufacturing concerns in this country, and also for one of the largest manufacturers of rubber chemicals.

4. Q. Please state if you have read and understand the invention described in the patent in suit to Weiss, No. 1,411,231, and particularly as claimed in Claims 5, 8, 9 and 12?

A. Yes.

5. Q. For the benefit of the Court, will you please explain briefly the history and general processes of rubber vulcanization, including the use of substances for accelerating, the cure or improving of the product, particularly the organic substances, and state the nature, the characteristics and functions of diphenylguanidine, as set forth in the patent?

A. In order to convert raw rubber, which in its raw crude state has comparitively little use in the arts, into a material of very much greater value, it is subjected to a process known as vulcanizing, which is the fundamental process in all rubber manufacture, and consists essentially in mixing the rubber with sulphur—that is the most practical form— and then heating the mixture. The effect of this treatment is to improve tremendously the qualities that we describe in a particular kind of way as the elasticity of the rubber and other properties too. Even from the very earliest days of rubber manufacture, substances which

would hasten the process of vulcanization have been known. They were all of an inorganic character, such as lime, and so forth, but during the present century, materials of an organic character have been found, which will bring about this increase in the rate of vulcanization. Now, I think I should explain that this term "accelerator" carries with it a certain amount of ambiguity. On its face, one would naturally take it to mean merely an increase in the speed of vulcanization, but undoubtedly the substances that we for convenience refer to as accelerators are capable, some to a greater extent than others, of producing many beneficial effects in the quality of the product, in addition to increasing the rate of vulcanization. So that there is this unfortunate ambiguity attached to the term, which really has a wider significance than might at first appear. The patent claims the use of disubstitutedguanidines, and mentions in particular the use of diphenylguanidines, diarylsubstitutedguanidines, producing an improvement of the qualities of the product, and one has a second object, according to the patent itself, the increasing of the speed of vulcanization. Now, the aspects in which it does improve, or is claimed to improve, the quality, are several. It improves the strength, it is stated to improve the strength of the rubber and also its texture. Now, those two matters might be considered together, and would perhaps be included under the more general term of elasticity. By the strength I mean the amount of force which is required to pull a rubber in order to rupture it, to break it. By the texture we mean various qualities, but perhaps particularly the toughness, the amount of force which is required to stretch the

rubber to something short of the point of rupture. I think that is perhaps the best measure of toughness and these qualities, an improvement in the strength and toughness would undoubtedly result in a rubber with better wearing qualities, better resistance to abrasion when applied, for instance, in a tire tread, better resistance to tearing, and in general better wearing qualities. Furthermore, I think one should recognize, too, that a substance which is called for convenience an accelerator which is capable of bringing about improvements in the quality of the rubber would enable a rubber compound—I should explain that it is very seldom that rubber and sulphur are used alone; they are almost invariably mixed with a variety of powders, in order to get the requisite properties. I was going to point out that an improvement in the strength and in the toughness would enable you to secure a given result in your ultimate product with cheaper powders, less than would be required in the absence of an accelerator, if it were not able to attain this extra toughness and strength. Then again it is a very serious defect in a rubber article, this rapid, unduly rapid depreciation with age. That is a matter that has always been kept in mind in manufacturing rubber goods. It is claimed in this patent that the use of diphenylguanidine and other disubstitutedguanidines as accelerators diminish the tendency of rubber goods to undergo depreciation on keeping. There are other respects, other connections, in which diphenylguanidine produces advantageous results, other than merely hastening vulcanization. I think in order to bring those out, perhaps one would have to institute some sort of comparison be-

tween diphenylguanidines and the materials that were available as accelerators at the time it was discovered. Perhaps I ought not to go into such a long comparison, but I may say that after having considered carefully diphenylguanidine in comparison with the accelerators that were available, commercially available, at the date this accelerator was discovered, that I can see no other accelerator, none commercial at that time, that approached diphenylguanidine in regard to the collection of advantages which it displayed. There may have been an accelerator here that was as good as diphenylguanidine in one respect, and one here that was as good in some other respects, but for a collection of advantages in one substance, I think undoubtedly diphenylguanidine presented a very great advance on anything in commercial use at the time. It had various advantages as a commercial matter, aside from those advantages affected in vulcanization, advantages which no other accelerator I think available at that time possessed in the same measure. It was, for instance, not poisonous; toxic character was a decided drawback attaching to many of the accelerators known at that time. It was not soluble in water, and therefore could be used with safety when vulcanizing the rubber goods with open steam, as vulcanization is often carried out by that method. Heat is applied by open steam. But it was soluble in the rubber, which was a valuable quality, dispersing it uniformly in the rubber. Furthermore, in addition to not being toxic, it was stable; it could be kept indefinitely. Whereas, some of the substances available at that time were not stable. It doesn't have any tendency to take up water when you expose it to the air, which was a defect at

that time. Furthermore, it is a powder, and is very agreeable on that account to the rubber compounder. It is a fine powder and it is a definite substance, with a definite melting point, and is very easy to check on its purity; and such features as those I have mentioned give it more definite advantages as a chemical. Then again it didn't suffer from the disadvantage of producing discoloration in rubber goods, which some of the accelerators known at that time did. It is an excellent accelerator to maintain a white color in a product. I don't know that I should elaborate any further on this advantageous effect on the physical properties or elastic properties of the rubber, but perhaps just one other point in that connection I might mention. I should explain that in vulcanizing, mixing a given amount of sulphur with the rubber, if you increase the period through which you heat this mixture, and if you increase the vulcanization further, the material cools off and tends to become brittle. You have to choose this optimum point in choosing vulcanizing conditions for chemical operation. Now, it is obviously an advantage that this optimum point should not be too sharp; that is to say, you should not be able to begin to drop down into a brittle character too quickly. If there was any slight error in the mill operations, it is liable to produce a bad quality of rubber, so it is a distinct advantage to have a rather long period at times over which you can still get substantially optimum qualities and the diphenylguanidines and the disubstitutedguanidines particularly have an advantage from that point. They give this rather long period of vulcanizing time over which you are still getting good results. That quality

is usually called flat curing. But it is obvious that its presence is going to give you a more fool-proof rubber mixture than you would get in its absence. Furthermore, in some cases it is considered desirable to leave no free sulphur in the compound with the rubber at the end of the vulcanizing period, or at least substantially not. If any free sulphur is left, that will come out in the form of fine crystals on the rubber goods, and has that familiar shiny appearance. That appearance of sulphur is called bloom. In some cases it is desired not to have a blooming character of rubber goods. That of course means essentially that you must not have any very great amount of free sulphur left when you finish your vulcanizing heating. I think undoubtedly the use of disubstituted-guanidines as accelerators assists the attainment of such a non-blooming, because they will allow you to use a comparatively small amount of sulphur and drives the vulcanizing forward so as to get optimum results, and get quality in your product with such a small amount, and leaving very little free sulphur, and therefore resulting in the absence of bloom in the finished product. I think one might say that a really desirable accelerator should be considered not merely as hastening the speed, shortening the time in which you have to heat your rubber, but increasing the vigor of this vulcanizing reaction; so it pushes it home and gives you an improved result in the product as well as shortening the time through which you have to heat the mixture.

I was trying particularly, I think, to emphasize the fact that this term "accelerator" really has a broader significance than might appear on the surface, and one has to take into consideration the effect of the material and the qualities of the product, as well as the period of time in which you have to heat your rubber.

6. Q. Will you explain generally the various operations that rubber goes through from the crude rubber and the fillers and other things put in with it, until the finished goods is rendered; that is to say, explain generally milling, sheeting, curing and those terms, and just where the accelerator has any function in those various operations?

A. Stating the process of rubber manufacture in a fairly general way, the raw rubber, which is too hard in its original condition, is worked on a mill, the rolls of which are heated, and as a result of mechanical working and the heat, it is rendered plastic, comparatively plastic. Then there is incorporated into it this plastic material, plastic gum, sulphur, which is the essential vulcanizing agent usually, a variety of powders which have definitely advantageous effects, especially when the rubber has to be subjected to abrasive wear, as in the case of a tire tread, and if an accelerator is to be used, that too is usually incorporated at this stage. Quite a variety of mixtures are made, but they always contain sulphur as the vulcanizing agent, and very generally today an accelerator. This mixture having been made as uniform as possible is then converted into suitable

shapes. Quite frequently it is put through a calender consisting of three rolls vertically arranged, and passes through the first two and then the bottom and in that way is converted into a sheet which is comparatively plastic in this stage. From such sheets the greater part of rubber articles are built up in one way or another. The building operation of course depends upon the article, whether hot water bottle or a tire, or whatever it may be. Then this mixture having been made up, is then subjected to heat in some convenient way. The exact way depends largely upon the nature of the goods you are making. If you are making a tire, you put your made up tire in a heavy form, and press the two portions of the form together, and usually subject that to steam at a temperature corresponding to about 40 pounds of steam pressure, something of that order. If you are making rubber tubing, you may not have your material in the form, but just let it loose in a soapstone and again use steam. In certain cases you apply the heat in the form merely of hot air, if making footwear; but in all cases the essential features are that you have a mixture of rubber with various powders as a rule, with sulphur and usually with an accelerator, and you then shape that into the article you wish to make, and heat it. Those are the essential features of the preparation of vulcanized rubber.

7. Q. During the milling and calendering, is it desirable that the accelerator be active or inactive?

A. It is very undesirable that the accelerator

should show any activity at the temperatures that prevail during milling.

8. Q. Why is that?

A. Otherwise it would start the vulcanizing process, begin to be active at these temperatures, and your rubber would begin to stiffen up, become what is technically called scorched.

9. Q. As triphenylguanidine is mentioned in one patent in suit, will you briefly compare it with disubstitutedguanidines, and particularly diphenylguanidine, as mentioned in the patent in suit?

A. I think that one can merely say that undoubtedly diphenylguanidine is a very active accelerator; not merely does it increase the speed of vulcanization to a much greater extent than does a similar amount of triphenylguanidine, but it gives very much improved physical properties in the product, the elastic properties. strength, and so forth, to which I previously referred.

10. Q. It is stipulated as a fact in this case that the defendant used diphenylguanidine in the proportion of close to two-thirds of one per cent on the rubber, as an accelerator in the vulcanization of rubber, the vulcanizing agent being sulphur. Do you understand what is meant by that?

A. Yes.

11. Q. Will you please compare that stipulation of use by defendant with Claims 5, 8, 9 and 12 of the patent in suit, and state whether or not you find the subject matter of such claims embodied in that stipulated use?

By Mr. Edmonds:

I do not think this is a proper question. I do not know just what Your Honor's practice is, but I don't see how the statement of this witness in that regard can be of any service to the Court.

By the Court:

What is the nature of this proof you propose to put in?

By Mr. Wooster:

The stipulation is not in exactly the words of the claim, and the claim perhaps, to the mind of the Court, may be not clearly understood on its face; and the purpose of this question is to have the testimony of this witness that the language as stated in these claims does mean what is stipulated in that formula as used by the defendant. Perhaps another way of reaching the same end would be to have this witness compare the formula as stipulated by the defendant with what is disclosed in the patent, not referring to any particular claim, and particularly the specific formula that commences at line 98, page 1, of the patent.

By the Court:

I think you may go ahead with that. This is merely a line of explanation, as I get it. It is not the passing of the witness upon the issues.

By Mr. Edmonds:

The question might just as well have been, "Does this defendant infringe?" The question means that and nothing else.

By the Court:

It is not our purpose to allow that. It is merely, as I understand it, an explanation. Of course, I think it is improper, because that would be the duty of the Court to determine, and not by the witness to express an opinion; but assuming it is not that, I will overrule the objection.

(Question read).

A. Yes.

By Mr. Wooster:

12. Q. Will you compare the formula as used by the defendant with the disclosure of the patent, and particularly the specific example given at lines 98-102, page 1, of the patent in suit, and state what, if any, difference you find therein.

A. Comparing it with the example given on the lines of the place mentioned, I find that this stipulated condition does not include the use of any zinc oxide along with the rubber; but in comparing it with the disclosure of the patent in general, I believe that those conditions are covered by the patent —the stipulated conditions are covered by the patent.

13. Q. State whether or not the advantages of diphenylquanidine as an accelerator, as understood by you, are or are not attained by the formula stipulated by the defendant?

A. Yes, I would say so, speaking broadly.

CROSS-EXAMINATION.

By Mr. Barrows:

X14. Q. When did you first learn that diphenylguanidine was a rubber accelerator?

A. I couldn't say.

X15. Q. You have no recollection?

A. I have no recollection, no.

16X. Q. Do you think it was shortly after the paper was read by Dr. Kratz in September, 1919?

By Mr. Wooster:

Nothing about Dr. Kratz was mentioned in the direct examination.

By the Court:

The general assumption is perfectly correct. It is true it might be possible that there is a misunderstanding. Perhaps what ought to be asked first as far as the understanding of the witness is concerned, is whether he knows of such a paper, and whether it has ever been called to his attention. Of course, there is an assumption of his knowledge, which does not appear in the testimony as yet.

By Mr. Barrows:

X17. Q. Do you recall that you knew about diphenylguanidine prior to September, 1919, as a rubber accelerator?

A. No.

X18. Q. Does the letter that I hand you refresh your recollection as to when you did first learn of diphenylguanidine as a rubber accelerator?

By Mr. Kennedy:

I object to the inquiry, on the ground that the question, as I understand it, asks this witness as to when he first learned of the use of diphenylguanidine as an accelerator. For the purpose of refreshing his recollection, as I understand it, he is shown a letter. That letter, according to my reading of it, has nothing whatever to do with the use of diphenylguanidine as an accelerator, but it has to do with a matter of defense, which should go into defendant's case and not be injected into the plaintiff's *prima facia* case.

By the Court:

He is not offering that letter. This is only, as I understand it, shown him, and he is asked the simple question as to whether that refreshes his recollection. The answer then is simply yes or no, I take it. However, the question may have gone beyond that.

By Mr. Barrows:

The witness has testified at great length as to diphenylguanidine, and I think I am entitled to cross-examine him on that.

By the Court:

The offering of it might be objectionable at this time, but for the mere use that it is put, I cannot see that it is improper.

(Question read).

A. I see from this letter that I must have read the extract of a paper by Kratz.

By Mr. Wooster:

I would suggest the witness be instructed to answer yes or no, and not state the contents of the paper.

By the Court:

That is perhaps not responsive to the question. The answer should be yes or no.

A. Yes.

By Mr. Barrows:

X19. Q. Can you now tell me when you first learned that diphenylguanidine was a rubber accelerator?

A. I think that I must have seen the abstract of the paper by Mr. Kratz.

By Mr. Wooster:

Objected to as not responsive.

A. My recollection is that Mr. Kratz mentioned the fact in his—

By Mr. Kennedy:

Objected to as also irresponsive. He is getting things into the case that are not to go into it.

By the Court:

Yes, that is quite true. You are just asked to give the date. You may have got it in a particular way, perhaps by means of a particular paper, and you are simply asked the date of that paper.

A. I believe that was around in October, 1919.

By Mr. Barrows:

X20. Q. Where did you learn that diphenylguanidine was a rubber accelerator?

By Mr. Kennedy:

Objected to as immaterial.

By Mr. Barrows:

I said where.

By the Court:

All right.

A. I presume from the abstract of Mr. Kratz's paper.

By Mr. Kennedy:

Objected to as not responsive to the question. The question is, where did he learn it, which means, where was he when he learned it.

By the Court:

Yes, it is a mere matter of locality. Of course, if you understand what he means by that, you may so state.

A. From an abstract of Mr. Kratz's paper.

By Mr. Kennedy:

Objected to as irresponsive and volunteered. Also, I move to strike out the answer on that ground, and on the further ground that now the defendant is obviously attempting to interject into the plaintiff's *prima facie* case a matter which, according to their own opening statement, is a matter of defense, and as to that, if they persist in the inquiry, they should be compelled to make the witness their own.

By the Court:

They ought not to introduce their defense in cross-examination, but at the same time they have a right, if they desire, to test the qualities of a witness as an expert. They have a right to bring out that particular knowledge. The only thing I would say to counsel in that regard is that I would unquestionably admit the evidence along that line for that particular purpose, if you have not placed upon the record an admission as to his qualifications.

By Mr. Edmonds:

We admitted that he was qualified as to the general subject of rubber.

By Mr. Kennedy:

In the direct examination of this witness, the witness stated that he was familiar with the use of accelerators, and he may have said particularly diphenylguanidine and other things, I don't recall, but what he did testify to was that he was familiar with the use. What they are confronting him with now is not when did he first learn of, or become familiar with, the use of diphenylguanidine, but where he got his first information as to diphenylguanidine as an accelerator, and when he got it. That is part of their defense. It is no part of the plaintiff's case on direct or cross-examination. We are not disposed to keep anything out of this case which would give the Court light. We know this defense is going in, and we are prepared to meet it, but

we should not be compelled to meet it on our *prima facie* case.

By Mr. Barrows:

I think I am entitled to find out on what basis he makes these assertions, and to find out where he got the information.

By the Court:

I am disposed to allow you to go ahead on your cross-examination, as to the test of his knowledge as a witness. As to the ultimate effect on the case, that would be another proposition. I will overrule the objection at this time and note an exception to plaintiff.

By Mr. Kennedy:

But if Your Honor does permit them to go into this, which is obviously a matter of defense, it is within your province to reserve for the plaintiff here, and I should think your Honor should reserve to the plaintiff here, the right to deal with this as with other defenses in their rebuttal proof, instead of compelling the plaintiff to deal with it in their *prima facie* case.

By the Court:

I have so indicated, that I was not considering that feature at this time, but will subsequently take it up when we find out what the extent of the development here is.

By Mr. Kennedy:

May I have a running objection without repetition, to this line?

By the Court:

Certainly.

By Mr. Barrows:

X21. Q. From what source did you learn, in October, 1919, that diphenylguanidine was a rubber accelerator?

A. From an abstract of the paper by Messrs. Kratz, Flower and Coolidge.

X22. Q. You saw it about that time?

A. I presume so, yes.

X23. Q. You referred in your direct examination to a book which you had written. This book, I believe, is entitled "Plantation Rubber and the Testing of Rubber," one of the monographs on industrial chemistry, published in 1920, by Longmans, Green & Company. This is the book, is it not?

A. Yes.

By Mr. Barrows:

Will you agree, Mr. Wooster, that either side may refer to this book without putting it in evidence?

By Mr. Wooster:

Yes.

By Mr. Barrow:

X24. Q. On pages 106 and 107 of this book, there is a heading, "Natural and Artificial Accelerators," and on page 197 you give a list which you say is not exhaustive of substances that have been found effective as organic accelerators, and group 4 in this list is entitled "Urea, Thiourea, Guanidine Derivatives." Do you recall what guanidine deriva-

tives you were familiar with at the time you wrote this book?

A. No. I have no very clear recollection, but I imagine that I had the information mentioned, at least, in that abstract.

X25. Q. Possibly the original paper?

A. Quite possible, yes.

X26. Q. In fact, the original paper is referred to in a footnote on that same page?

A. Yes, that is so.

X27. Q. And this original paper is in a footnote headed "For literature on the subject of accelerators, see so-and-so," and the last paper is the paper of Kratz, Flower and Coolidge?

A. Yes.

X28. Q. What practical experience have you had in rubber factories?

A. I have never held a position in a rubber factory. I have done consulting work for rubber firms, rubber manufacturing firms.

X29. Q. The actual experience you have had in vulcanizing is then all of scientific or laboratory character?

A. No, not entirely.

X30. Q. To what extent have you had experience in factory rubber vulcanization?

A. In the way of research work, directed to rubber manufacturing problems.

X31. Q. Your work as consulting chemist for one of the rubber companies in the United States and Canada is largely work of that kind, is it not?

A. That is so, yes.

X32. Q. What do you understand by the class of disubstitutedguanidines, which you have referred to in your direct examination?

A. Well, reading it in the light of the patent, I should interpret it as meaning diarylguanidines.

X33. Q. You would say it included all diarylguanidines?

A. I should say so.

X34. Q. Do you know whether all diarylguanidines are rubber accelerators?

A. I do not, no.

X35. Q. How many do you know that are rubber accelerators?

A. I couldn't say offhand, but at least six, I should say, that I know of definitely.

X36. Q. How long have you known about these six?

A. Roughly a year, I should say.

X37. Q. You have known of diphenylguanidines since 1919, and the other five or six for about a year?

A. I should say so, yes.

X38. Q. How many disubstitutedguanidines are there altogether, have you any idea?

A. I don't know how many are capable of staying. Probably a very large number.

X39. Q. Possibly hundreds or thousands or more?

A. No, not as things that any chemist would ever think of preparing, except for some experimental special purpose. The number that would naturally occur to him to prepare, if he were to study that class of substances, is comparatively small.

X40. Q. But my question is not what any chemist would think of preparing, but how many there are that he might prepare, or that might be considered to exist within this class of disubstitutedguanidines?

A. One would have to work that out, I mean on paper. A very large number, no doubt, could exist, just as, for instance, more than three million azo dyes have been calculated as capable of existence, but that doesn't mean as having practical interest. Not more than two or three thousand have ever been looked into—Not that I wish to suggest that anything approaching three million of disubgaunidines are capable of existence. The point is that while theoretically a large number are capable of existence, a comparatively few have any conceivable practical interest.

X41. Q. And you can't say how many of these are accelerators, or would be accelerators?

A. Not absolutely definitely, but in view of the present state of our knowledge, I think I will say that if there were no other group present in the nucleus if a certain group such as nitrates were passing, then all the diarylsubstitutedguanidines would almost certainly be accelerators.

X42. Q. Do you find anything in the patent about the groups you mention as being present and not being present?

A. No.

X43. Q. How would you determine whether any one of this large number of disubstitutedguanidines was a rubber accelerator?

A. By direct experiment.

X44. Q. Making up the compound of rubber and sulphur—

A. That would be a final test.

X45. Q. It is an empirical proposition?

A. No, not wholly; because, as I have already stated, any disubstitutedguanidines, the general type of disubstitutedguanidines, would be an accelerator.

X46. Q. But in order to tell what kind of an accelerator, whether a good one or not so good, what kind of properties it would give, there is only one way of finding it out?

A. When you come down to quantitive differences, undoubtedly a test is the only way.

X47. Q. Let me ask you if this is the abstract which you said you saw in October, 1919? I hand you Chemical and Metallurgical Engineering, for October 1, 1919.

By Mr. Kennedy:

Objected to as incompetent, so far as the date of that publication is concerned, which appears at the top of the page. And upon the further ground, as I understand from my associate, the question of stipulating the date that appears on that publication was considered by him with counsel for the defendant, and resulted in the refusal on his part to stipulate that date, and the reason that he refused, and the reason I refused, to stipulate that date, is because, according to my information, it is quite common for a publication to be issued at a later date than the one it bears, and we know in some of these cases that that is so. Therefore, in confronting

the witness with this paper or magazine dated October 1, 1919, counsel for defendant is confronting him with something the date of which we question, and at the same time misleading the witness, intentionally possibly, into stating at that time he saw this abstract.

By the Court:

If the date were to determine that, it would be a matter of subsequent proof, but as I understand the testimony, it was simply the identification of a particular magazine rather than the fixing of a date. This was merely for the purpose, as I got the inquiry, of the identification of the book. I don't recollect the exact wording of the inquiry put to the witness.

(Question read).

By the Court:

That does bring in an assumption there. As I got it, it was an agreed identification of the paper.

By Mr. Barrows:

If the witness will tell what abstract he saw, from which he got the information, I will be quite satisfied.

By the Court:

There is no question about your dispute as to date. If that becomes relevant in the inquiry, this, of course, is not to be determined in this way. This is not the best proof of that subject, but as a mere identification as to whether

he got it from that particular magazine, or a copy of that magazine, which is identified under that date, and that simply brings into evidence the source of it, and any question is to be subsequently determined and by other proof.

By Mr. Kennedy:

It appears in their question that this is a printed publication more than two years before the filing of our application. They do not have to put this in. If this kind of testimony is to proceed—because they will have enough for argument, at least, and enough to put us on our proof, where we should not be put now, with that abstract which he says he saw in October or September, 1919, was this abstract, and therefore a printed abstract in a printed magazine, and a printed publication within the meaning of the statute of the United States. Therefore, no reference should be permitted to that abstract. As I said before, all they are concerned with is the date. Now, under the guise of seeking further light as to the date, they try to interject this printed publication, to which we object as incompetent.

By the Court:

I know I shall not in passing upon it give it that particular weight which you seem to think. However, there is a good deal in what you say, in so far as a subsequent record is concerned.

By Mr. Barrows:

I am willing to withdraw the question.

RECESS.

AFTERNOON SESSION.

GEORGE STAFFORD WHITBY resumes the stand.

CROSS-EXAMINATION (continued).

By Mr. Wooster:

May I make a request on the record of plaintiff's counsel, before this examination proceeds any further?

By the Court:

You may.

By Mr. Wooster:

I request Mr. Edmonds to confirm on this record a statement previously made to me in New York, to the effect that defendant will not introduce proof of actual publication date of the abstract of the Kratz, Flower and Coolidge paper, published in the issue of the Chemical and Metallurgical Engineering for October 1, 1919. The reason for making this request now is that plaintiff is prepared to prove the actual date of publication of this paper, but on statement made by Mr. Edmonds to me that the defendant would not offer any proof of its actual publication date, plaintiff has not the witnesses here, and desires to either summon them here by telegraph before

the case closes, or to examine those witnesses by deposition in New York.

By Mr. Edmonds:

I don't think that it is incumbent upon me to make a statement of what I propose to do, but I have no objection to reiterating what I said before, that I had no witness to prove the date of a certain publication, and I have not one now. I would like naturally to have proof of that publication, and if any one of plaintiff's witnesses offers to prove the thing I want to prove, I would certainly be very foolish not to avail myself of it. But it is true now, just as I stated in New York, that defendant has no witnesses, and does not expect to have any witnesses, on this particular publication.

By Mr. Barrows:

X48. Q. Can you say now, Dr. Whitby, what abstract it was you saw in October, 1919, of the Kratz-Flower-Coolidge paper?

By Mr. Kennedy:

I assume this is under the same objection.

By the Court:

Yes.

A. Yes. It was a typewritten abstract that Mr. Kratz sent me.

X49. Q. And where did you get that abstract from, do you recall?

A. From Mr. Kratz.

X50. Q. In your direct examination you have

mentioned various advantages which diphenylguanidine presents from a chemical standpoint. It is not soluble in water, is soluble in the rubber, can be kept indefinitely, can be prepared in a fine powder, is a definite chemical substance, does not discolor rubber. Are any of these properties properties which differentiate from triphenylguanidine?

A. Being soluble in the rubber, insoluble in water, stability, and its being a definite chemical compound, and its being preparable in the form of fine powder.

X51. Q. The two things are very similar indeed in these respects?

A. Yes.

X52. Q. And in discussing the advantages of diphenylguanidine from a chemical standpoint, you were not trying to make a point that from a chemical standpoint, diphenylguanidine has any great advantage over triphenylguanidine?

A. I was comparing it with the accelerator of that, but considered it as a whole, and not contrasting it particularly with triphenylguanidine, but with the accelerator's condition taken as a whole.

X53. Q. You do not mean to say that triphenylguanidine was not then known.

A. Certainly not. Reviewing the accelerators then known, some of them, quite a considerable number, could not be said to have all these properties.

X54. Q. In other words, some accelerators not triphenylguanidine, do not have some of the properties that diphenylguanidines have?

A. Yes.

X55. Q. And diphenylguanidine and triphenylguanidine, from a chemical standpoint, have the same or similar properties?

A. Quite similar, as chemicals.

X56. Q. You mentioned, as I recall it, the fact that diphenylguanidine was not soluble in water as an advantage over certain accelerators. Is it very insoluble in water?

A. There is no doubt but it is stated to be very sparingly soluble in water.

X57. Q. Sufficiently soluble, so that you can dissolve it in water, and recrystallize it from water?

A. I don't think so.

X58. Q. You said that diphenylguanidine does not discolor the rubber? That is equally true of triphenylguanidine, isn't it?

A. I should say so.

X59. Q. You said that diphenylguanidine gave a flat-top vulcanized curve. Isn't that equally true of triphenylguanidine?

A. I have not very extensive data on triphenylguanidine, so I would not care to say definitely; but I should say that considering the broad range of other mixtures, diphenylguanidine has undoubtedly an advantage over triphenylguanidine, in respect to the flatness of the vulcanizing curve.

X60. Q. That is your opinion?

A. That is my opinion.

X61. Q. But you haven't investigated triphenylguanidine enough to really know?

A. To say conclusively, no.

X62. Q. In your direct examination, you dis-

cussed the patent in suit, and I call your attention to the example which the patent gives, which is stated to be the preferable method of carrying out the invention? Have you a copy of the patent?

A. Yes, sir.

X63. Q. Beginning at line 98, "The rubber may be compounded in the following proportions: 50 parts by weight of new rubber, 45.5 parts by weight of zinc oxide, 3.5 parts by weight of sulphur, and 1 part by weight of diphenylguanidine." Would this compound be an advantage or give a flat-top curve, which you say is characteristic of diphenylguanidine?

A. To some extent, but I would not say it is absolutely the most suitable compound to bring out the property in the fullest degree.

X64. Q. In fact, this compound is a very quick curing compound?

A. Yes, sir.

X65. Q. And it over cures very quickly?

A. I wouldn't say that that is necessarily so.

X66. Q. Do you know?

A. No, I wouldn't say it over cures very quickly. I will say it will over cure.

X67. Q. Have you ever carried out the example of this patent?

A. Not strictly.

X68. Q. On what basis do you propose to tell the advantages which diphenylguanidines have as an accelerator, if you have not carried out the example of the patent in suit?

A. On other tests.

X69. Q. Tests that are not described in the patent in suit?

A. Tests other than that specific example.

X70. Q. And you don't know whether the process carried out in that example would have the advantages that you describe or not?

A. Yes, I think I may say it would.

X71. Q. But you don't know of your own knowledge?

A. Not by direct experiment with that particular mixture.

X72. Q. You said among the advantages of diphenylguanidine, one was that it permits the use of small amounts of sulphur. Would you call the amount of this example 3.5 by weight to 50 parts of new rubber, a small amount of sulphur?

A. No, I should not say that was a very small amount. It is not as small as is permissible to be given with diphenylguanidine.

X73. Q. In fact, it is much larger than you used as the basis of the tests from which you based your opinion?

A. No; I have used the various proportions for the tests, larger and smaller.

X74. Q. Just what test have you made yourself as the basis on which you make the assertions which you made in your direct examination in comparing diphenylguanidine with triphenylguanidines, and with all other known accelerators, which I assume you have proposed to do in your direct examination?

A. I have not directed any extensive research to diphenylguanidine alone to a greater extent than

the case of other accelerators. I have probably studied about three hundred odd accelerators at one time or another, taken tests with diphenylguanidine, fairly extensive tests, and of course there is a very large amount of material available on diphenylguanidine in literature, which can be subjected to critical examination and passed upon critically, so that one will be in a position from that alone to decide on the advantages of diphenylguanidine.

X75. Q. And part of the information on which your opinions are based is material that is published in the literature?

A. Indubitably.

X76. Q. And you made a thoroughgoing study of the subject and studied various books on diphenylguanidine?

A. In addition to my own work, I studied all of the publications.

X77. Q. Now, in this test which you have made yourself, and which I understand were not the specific example of the patent in suit, what percentage of sulphur did you use with the diphenylguanidine?

A. Used 10 and 5 I think particularly.

X78. Q. Have you any record of these experiments here?

A. Yes, I have one or two.

X79. Q. One or two?

A. Yes.

X80. Q. Have you records here of your comparative tests of diphenylguanidine and triphenylguanidine, or D. P. G. and other accelerators, as the basis on which you made the statement which you did make in your direct examination?

A. I make these statements to a very large extent on what can be ascertained from the literature.

X81. Q. Rather than firsthand information which you have yourself?

A. Well, my first information, my study of D. P. G. is not in itself a very extensive research in itself, to study it in all these aspects to which I referred, and that alone would not enable me to make statements as to its value compared with other accelerators or all those compounds I mentioned.

X82. Q. How much time have you yourself spent in carrying out tests or experiments with D. P. G.?

A. Well, I don't have much time to do laboratory work with my own hands, but I have planned and directed quite a considerable amount of work.

X83. Q. On D. P. G.?

A. Yes, and on D. P. G. accelerators, or accelerators in general.

X84. Q. How much work would you say you have planned and directed, and followed closely, with D. P. G. tests?

A. Well, quite a considerable amount of work. I would not like to say how many tests were involved, but probably something like, perhaps, forty or fifty different rubber mixtures.

X85. Q. You said you had made a thoroughgoing study of the literature as a part of the basis of the opinions that you have expressed. You included, I assume, in that study of the literature, the Kratz paper?

A. Yes.

By Mr. Kennedy:

That is objected to as attempting to introduce into the plaintiff's *prima facie* case matters of defense. Perhaps I am stating this unnecessarily, it being my understanding that there is a running objection.

By Mr. Barrows:

I think when the witness assumes to come here as an expert and base his assertions on statements in literature, that we are entitled to ask him if among this literature there is a particular one.

By the Court:

Yes, we will overrule the objection and note an exception.

By Mr. Barrows:

X86. Q. Dr. Whitby, what is the earliest literature that you have any present recollection of, that relates to the use of D. P. G. as an accelerator?

A. That paper just mentioned.

By Mr. Kennedy:

The same objection.

By the Court:

Objection overruled. Exception noted to the plaintiff.

By Mr. Barrows:

X87. Q. How long have you known the various advantages which you say D. P. G. has over all other accelerators?

A. I haven't stated it has advantages over accelerators in those respects. I was comparing it with the accelerators known in 1919, in general use in 1919.

X88. Q. Limiting my question to the scope of your answer comparing D. P. G. with other accelerators known in 1919, how long have you personally known of advantages which D. P. G. presents over those well-known accelerators?

A. Since about 1923, I should say.

X89. Q. How did you learn what those advantages were in 1923?

A. Well, by a study of results, tests that were made in which I was interested, tests made by friends, and also by study of the literature; a large number of tests carried out in different laboratories.

X90. Q. In fact, that is a customary method of obtaining information about any accelerator, by making a test in the laboratory and studying the literature?

A. Making a test in the laboratory and studying the literature, and observing the way it works out in practice, if it is put in actual commercial use.

X91. Q. How many accelerators would you say there were known in 1919?

A. I wouldn't like to say how many were known exactly, but I could say roughly how many could be introduced for technical use, actual use in the industry, something in the way of, let us say, a dozen that actually came into some degree of use.

X92. Q. Then comparing D. P. G., are you limiting your comparison to this dozen which you say

were then in industrial use, or do you include the larger class of known accelerators, some of which for one reason or another may not have come into use?

A. No, I don't refer to the large class.

X93. Q. But you know that there was a very large number of known accelerators in addition to those which have come into industrial use?

A. Yes, the presumption, of course, is that they hadn't any advantages, and those that were tried industrially were those which appeared to be the most advantageous ones.

X94. Q. But one of the considerations would, of course, be the price of the accelerator in commercial use?

A. Of course.

X95. Q. And if it was only available at a prohibitive expense, it wasn't industrially used, no matter how good an accelerator it would be?

A. Yes.

X96. Q. You spoke about the ageing qualities which D. P. G. has. Are you also familiar with the fact that T. P. G. also gives good ageing qualities to rubber, or is that something you are not sufficiently familiar with?

A. I have not an extensive data available on T. P. G., but comparing the capacities of the two accelerators tested, in a general way, I should undoubtedly say that D. P. G. is capable of giving qualities that will improve upon T. P. G.

X97. Q. Just what comparison do you refer to in determining that?

A. I have in my original testimony tried to develop the fact that D. P. G. was such a powerful accelerator that it was possible to cure rubber with a small amount of sulphur and leave very little free sulphur in the mixture. It is no doubt possible to do that with D. P. G. which is not possible with T. P. G., and therefore the general principles, considering the results of rubber as such, in general, would cause you to use the advantages that D. P. G. gives, because you could cure with less sulphur than in the case of T. P. G., and will in general give better ageing qualities.

X98. Q. That wouldn't be from compounds containing a large amount of sulphur and large amount of T. P. G.?

A. Not necessarily in working from that general principle.

X99. Q. In fact, this patent in suit with two per cent of D. P. G. on the rubber, and 7 per cent of sulphur on the rubber would be a very good ageing compound, unless you were very careful about curing it?

A. Well, if it were cured properly, it would, but it is not the ideal preparation.

X100. Q. It wasn't a test on a compound like that on which you based your differentiation against T. P. G. and D. P. G.?

A. No, not on a compound like that.

X101. Q. You spoke of one advantage of D. P. G. as being that it is inactive in calender and mill; T. P. G. has that same advantage, hasn't it?

A. I don't know that I have any data on that,

but I should say that it is comparatively satisfactory.

X102. Q. What practical experience have you had with T. P. G.?

A. What do you mean by "practical?"

X103. Q. Commercial experience, actual commercial use?

A. I have had no use in rubber factory.

X104. Q. You are not familiar with the methods of using T. P. G. in commercial rubber factories?

A. Well, I think I am familiar with them, but not by actual practice.

X105. Not by firsthand information, how it is used and what results are obtained?

A. Not by actual practice; no, sir.

X106. Q. Have you ever compared D. P. G. with T. P. G. in an example such as the patent in suit mentions, and used a larger amount of T. P. G. than of D. P. G.?

A. No.

X107. Q. Do you know whether a larger amount of T. P. G. would speed up the vulcanization and give the other desirable qualities which you say D. P. G. gives?

A. No, I say it is not possible to have quite as good a product from T. P. G. as from D. P. G.

X108. Q. That is your opinion?

A. Absolutely.

X109. Q. In your direct examination, you were asked whether a certain practice which is used by this defendant was within the claims of the patent in suit, or was an embodiment of the invention of

the patent in suit; would you say that any vulcanization of rubber with sulphur and with D. P. G. was the practice of the invention of this patent in suit?

A. I should say so, so long as it produced acceleration, as soon as you had sufficient to produce acceleration and improve the properties of the product.

X110. Q. And that would be true whether a mixture of rubber and sulphur and D. P. G. had various compounding ingredients with it or if there were other compounding ingredients?

A. Yes.

X111. Q. You stated that rubber and sulphur are seldom used alone. It is true, of course, isn't it, that in commercial compounds many different compound ingredients are used?

A. That is true.

X112. Q. Oxide and fillers and different ingredients of one kind or another are common practice?

A. Yes.

X113. Q. Have you any idea how many standard commercial compounds one of the large rubber companies in this country would have, say, for automobile tires?

A. Well, yes.

X114. Q. How many would you say?

A. Confined to automobile tires only?

X115. Q. Yes?

A. Well, with regard to one particular article, I would not like to say.

X116. Q. Fifty or one hundred?

A. That had been worked out, you mean?

X117. Q. No, in one factory in making a line of ordinary tires?

A. I should not say as much as fifty.

X118. Q. But a number?

A. Yes, considerable.

X119. Q. You haven't had any practice to say how many compounds one of the larger rubber companies would have for its line of tires?

A. No, I wouldn't like to say.

X120. Q. Are you prepared to say how many compounds one of the larger rubber companies would have in making rubber goods, not only tires but various other articles? Do you think it might have one thousand or more?

A. Yes, they might have a thousand.

X121. Q. Now, as a consulting chemist of one of those large rubber companies, how would you go about working to adapt D. P. G. to any one of those hundred or thousand different compounds in the rubber company? Just what would you do as a practical consulting engineer?

A. I should study it under very simple conditions, to begin with.

X122. Q. Take a sample compound and test it and see what it would do?

A. Yes.

X123. Q. And then you would take the compounds and you would make up your standard test formula, and with varying amounts of sulphur and accelerator, and finally you would come to the com-

pound and cure that would be the best for that particular purpose?

A. Yes.

X124. Q. That is the common practice in rubber laboratories?

A. Yes.

X125. Q. And has been for many years?

A. Yes.

X126. Q. Both before the days of organic accelerator and ever since?

A. Yes.

X127. Q. And that is what the chemists and assistant chemists are doing as part of their daily routine in rubber factories?

A. Exactly.

X128. Q. In fact, every rubber company of any importance has a laboratory with rubber chemists carrying out this kind of test every day, don't they?

A. Yes.

X129. Q. And it is from the result of these laboratory tests that they develop the factory compounds to control the factory practice?

A. Yes.

X130. Q. I think you stated that accelerators had been used from the earliest days, even at the beginning?

A. Yes.

X131. Q. That is my recollection; is that correct?

A. Yes.

X132. Q. Even Goodyear in his early work used lead oxide and litharge?

A. Probably not with definite recognition of its function.

X133. Q. And since that time you have learned a great deal about lead oxide and litharge, and Goodyear found he was doing something?

A. Yes.

X134. Q. I think you mentioned other inorganic accelerators, and I think you mentioned lime and magnesium oxide?

A. Yes.

X135. Q. And these are used in rather small amounts and will give quite a decided acceleration?

A. Yes.

X136. Q. And may I also say that the rubber vulcanized with these accelerators is a better product, and has better properties, than rubber vulcanized without them?

A. I might say so, yes. The advantageous properties would differ in different cases as to what you wanted it to apply.

X137. Q. And one advantage that results from using accelerators, even inorganic accelerators, is that you get a better product?

A. I think I might say that, yes.

X138. Q. And isn't it also true that since organic accelerators have been used—commercially true—the last dozen years, that it is often possible to get better products with their use than with the old inorganic accelerators?

A. One cannot use the term "better" without some reference to the use to which the rubber is to be put, but for many purposes better.

X139. Q. Take the large tonnage of rubber used in automobile tires. The use of accelerators during the last dozen years has improved very greatly the properties of rubber tires made with organic accelerators; you are familiar with that?

A. Yes.

X140. Q. And it has been the practice for several years, even back of 1919, to use organic accelerators that give these greatly improved properties in rubber tires?

A. Well, it is a question of distinction, because all accelerators do not give an improvement to the same extent, or not in as many respects, or they may have an advantage in one respect but be put to some disadvantages in another respect. So you cannot make such broad sweeping statements.

X141. Q. My statement is not broad or sweeping; it is a very specific one, that so far back as 1919, or earlier, the tires made commercially with organic accelerators had vastly superior properties over those made before the days of the orgonic accelerators?

A. I would say they have superior qualities.

X142. Q. And with different accelerators you would get different properties peculiar to accelerators you used, or you might get them?

A. You might get them.

X143. Q. And the result would also depend on such things as the amount of sulphur, or the presence or absence of other factors?

A. Those are the factors.

X144. Q. In fact, some of these other ingred-

ients may influence greatly the accelerating power of the accelerator, may they not?

A. Yes.

X145. Q. So that in any particular combination, no matter what your knowledge may be of an accelerator, you have to consider what influence the other ingredients have on the accelerator you are using?

A. You do.

X146. Q. And the only way that you can satisfy yourself would be to try it out and get first-hand information on that particular combination?

A. Yes, ultimately; that is the satisfactory method.

X147. Q. Are you familiar with the amounts of D. P. G. that are used commercially, the percentages of D. P. G., on rubber?

A. Yes.

X148. Q. What does that percentage amount to?

A. Well, I should say that probably the most frequent percentage is something in the way of one-half per cent, or possibly two-thirds, up to one.

X149. Q. Are you familiar with commercial uses as low as one-tenth of a per cent, or twelve one-hundredths of a per cent?

A. No.

X150. Q. You are not familiar with any such commercial use?

A. No.

X151. Q. In your study of the literature, do you know whether the Dovan Company has published papers recommending as low as twelve one-hundredths per cent?

A. No.

X152. Q. In your study of the literature on which you have based your opinions, do you recall this article appearing in the India Rubber issue of June, 1924, entitled "Diphenylguanidine?"

A. I believe I saw a similar article in French.

X153. Q. And this has a footnote that the data was supplied by the Dovan Chemical Corporation?

A. So I see here. I don't believe I noticed that in the French article.

X154. Q. In the second column of this page 589, under "Typical Compounds for Inner Tubes," the second compound is headed "Heavy Blooming Tube Rubber 100, Sulphur 5, Zinc Oxide 5, D. P. G. 125." You don't recall that particular compound as one of the commercial compounds?

A. No, I have no information.

X155. Q. Do you think that might be a commercial compound?

A. Well, not one that I personally should advise.

X156. Q. You said of D. P. G. that one of its advantages was that it produced non-blooming products. This particular compound we are discussing would be a heavy blooming compound. Do you agree with that?

A. Yes.

X157. Q. The bloom is due largely to the amount of sulphur present?

A. Yes, one of the factors.

X158. Q. In other words, you can make either bloom or non-bloom stock with D. P. G., whichever you please?

A. Yes.

X159. Q. In your direct testimony you refer to the patent, using the word "texture." You assume to state what you understood by "texture." Is that a recognized term of rubber technology.

A. It is not a commonly used one. We have terms such as toughness, tearability and perhaps grade, which is perhaps involved in tearability, and perhaps are all indicated generally by this term "texture."

X160. Q. But that term is not one of the common terms of the rubber chemists used in describing products made by vulcanizing rubber?

A. It is not used commonly, no.

X161. Q. So that your interpretation is something that you think was meant by it, and not something you can go to a dictionary and find, such as "tensile strength."

A. Yes.

X162. Q. Will you refer to the top of the second column of page 1 of the patent in suit, where it refers to the vulcanizing of hard rubber articles? It states "The use of diphenylguanidine not only hastens the vulcanizing action, but results in a final product much superior in texture, strength, duration and aging qualities over that when triphenylguanidine is used." Have you ever produced hard rubber with D. P. G. and T. P. G., to see whether that statement is in accordance with the fact?

A. No, I never did any experimental work.

X163. Q. And a little below that, on the same page, it says, "In these and similar instances, it has

been found that the use of triphenylguanidine requires from two to three times as long a period in vulcanizing as when diphenylguanidine is used, particularly at lower heat or steam pressures than those commonly employed." Do you know whether that statement is true or not?

A. Yes, I should say it is.

X164. Q. But that would depend a great deal upon how much D. P. G. and how much T. P. G. you use?

A. You mean the ratio or absolute amount?

X165. Q. The absolute amount or ratio. A higher amount of T. P. G. as compared with the lower amount of D. P. G. might not give any such results as that?

A. Well, defining the period of vulcanizing as the period required to get the especial qualities with that given accelerators, undoubtedly it would increase the amount of T. P. G. as compared with D. P. G., if you are going to make more equal the times required for vulcanization.

X166. Q. Then you would say this statement applies only when the amounts used are the same?

A. I should say that is the opinion of the statement, yes, although as a matter of fact, I believe no matter how much T. P. G. you took you could not get a rubber combination to cure as good as you could by the use of D. P. G.

X167. Q. That is your opinion?

A. That is my opinion.

X168. Q. Referring again to the advantage which you mention of D. P. G., that it permitted obtaining

a product with no free sulphur left, would you say it is possible to obtain such product with the combination of the specific example of the patent in suit?

A. Of course it is possible to obtain it with no free sulphur, yes; with substantially no free sulphur.

X169. Q. That is, with seven per cent of sulphur on the rubber?

A. If you care to vulcanize it on that basis.

X170. Q. Would the product be any good?

A. Not as good as if you didn't vulcanize so long.

X171. Q. Overcured?

A. Overcured.

X172. Q. And probably a worthless product for commercial purposes?

A. Yes.

X173. Q. And in that case you wouldn't say that the freedom from sulphur was an advantage?

A. Not when overcured.

X174. Q. Do you find anything in the patent which indicates that with a smaller amount of sulphur it is possible to get no free sulphur compounding without overcure?

A. Well, it is implied, I think.

X175. Q. Where does it tell you what to do to do that?

A. It doesn't tell you the specific conditions to achieve that end.

X176. Q. But those conditions would be different from this specific example?

A. Yes.

X177. Q. You will admit, Dr. Whitby, that there is a great deal more known about D. P. G. now than there was say four or five years ago?

A. Yes.

X178. Q. And that same thing is true about other accelerators—many other accelerators?

A. Yes, many others.

X179. Q. And we are learning new things about them right along?

A. Yes.

X180. Q. And it is still rather an obscure question as to just how accelerators work?

A. Yes.

X181. Q. The vulcanization of rubber, which you discussed in your direct examination, that is a progressive process, isn't it?

A. Yes.

X182. Q. The process is one that gradually comes to completion over whatever time it takes to bring it to completion?

A. Yes.

X183. Q. One of the facts that has been known for many years in the art of accelerators is that in general the strong nitrogeneous base is a good accelerator. That is a fact, isn't it?

A. As a general rule.

X184. Q. And that fact has been known for the past dozen years or so?

A. Yes.

X185. Q. As far back as 1912 or a little later, as you pointed out at page 196 of your book, the

claim was made that by nitrogeneous organic bases, which possesses a dissassociation constantly greater that 1 x 10^{-8} are accelerators. You thought this statement of claim was of sufficient importance to warrant placing it in your book, didn't you?

A. Yes; merely accepting it without prejudice, we will say.

X186. Q. And if that generalization were one that could be accepted, and you knew that D. P. G. was a strong base, would you understand from that it was also an accelerator without trying it?

A. If that statement were true, universally true, undoubtedly.

X187. Q. But you might question the statement?

A. Yes, certainly.

X188. Q. How would you determine whether any particular compound that was known in the realm of organic chemistry would vulcanize rubber or not?

A. Well, as a general rule, I should probably incorporate it into a mixture of rubber and sulphur, possibly with zinc oxide, and vulcanize that, in comparison with a similar mixture from which the accelerator was absent, or in which the accelerator which was satisfactory was present, vulcanize them and subject them to other tests.

X189. Q. By comparing the two tests, one without the substance, and one with the substance, you could tell from the results whether it was an accelerator or not?

A. Yes, I would say so.

X190. Q. And would you say there was no other way known to other chemists, except to try it?

A. Well, there are other methods of testing it.

X191. Q. But to tell whether any particular substance is a rubber accelerator?

A. There are other methods of testing it, but none as unexceptional as that was.

MORRIS L. WEISS, a witness called on behalf of the plaintiff, having been duly sworn, testified as follows:

DIRECT EXAMINATION.

By Mr. Wooster:

1. Q. What is your name, age, residence and occupation?

A. Morris L. Weiss; Newark, New Jersey; age thirty-eight; chemist.

2. Q. With what company are you connected?

A. With the Dovan Chemical Corporation, chief chemist in D. P. G. research.

3. Q. Are you also an officer of that corporation?

A. I am second vice president.

4. Q. Are you a stockholder in the corporation?

A. Yes.

5. Q. To about what proportion.

A. Twenty per cent.

6. Q. Where were you born?

A. Russia.

7. Q. When did you come to the United States?

A. In 1904.

8. Q. Had you had any schooling before you came to the United States?

A. Public schooling.

9. Q. What schooling did you have after you came to the United States?

A. Evening schooling and high school subjects.

10. Q. Where?

A. The Temple College, Philadelphia.

11. Q. During what period did you reside in Philadelphia?

A. From 1904 to 1908.

12. Q. Where did you go then?

A. To New York.

13. Q. How long did you reside in New York?

A. From 1908 to 1917.

14. Q. Where did you then go?

A. To Youngstown, Ohio.

15. Q. What did you do while you lived in New York?

A. Why, I attended the school of Applied Science, Cooper Union Institute, New York City, from 1908 to 1913. I graduated as chemist.

16. Q. Did you have any further education at any school in chemistry after you graduated from Cooper Union?

A. Yes; I entered the Polytechnic of Brooklyn, and graduated in 1916 with the degree of Bachelor of Science in Chemistry, my major being Organic Chemistry.

17. Q. During this period were you employed?

A. Yes; I was research assistant at Harriman

Research Laboratory, Roosevelt Hospital, New York City.

18. Q. During what period?

A. 1913 to 1916.

19. Q. With whom were you most closely associated?

A. Dr. I. Greenwald. I also was associated with Dr. Greenwald from 1912 to 1913, prior to my going to the Harriman Laboratory, he then being connected with another research laboratory.

20. Q. What kind of research was this?

A. Why, chemical research.

21. Q. What class of chemistry?

A. Chemistry pertaining to life.

22. Q. You mean bacteriological?

A. No, not necessarily. That is animal life—Bio-chemist.

23. Q. Up to this time had you had any experience with rubber chemistry?

A. No.

24. Q. Are you the Morris L. Weiss, the inventor of the patent in suit?

A. Yes.

25. Q. When you moved to Youngstown, Ohio, what did you do?

A. Obtained employment at the Republic Rubber Company.

26. Q. In what position?

A. General analytical chemist.

27. Q. What were your duties as analytical chemist?

A. Analyzing all various raw materials used in the manufacture of rubber goods.

28. Q. Will you name some of those raw materials which you analyzed?

A. Iron oxide; aluminum flake; clays; zinc oxide; letharge; magnesium; also cured rubber; finished rubber articles; fine air (?) ingredients. There is other materials like oils, waxes, gums.

29. Q. During what period did you do this work?

A. Why, the first few months I was employed there.

30. Q. Under whose direction did you do this work?

A. Mr. Clinton A. Carlton.

31.Q. What was your next position?

A. I was after that assistant chemist in the preparation of some organic compounds to be applied on accelerator vulcanization.

32. Q. Was this the first time you had experience with compounds for the acceleration of rubber curing?

A. Yes, sir.

33. Q. Under whose direction did you work at this time?

A. Under Mr. Clinton A. Carlton.

34. Q. For how long a time did you continue on this work?

A. Up until the time he left the employ of the Republic.

35. Q. When did you conceive of the use of D. P. G. or disubstitutedguanidines as an accelerator for the vulcanization of rubber?

A. I would say on or about March of 1918.

36. Q. Did you disclose that conception to anyone at the time?

A. I did.

37. Q. To whom?

A. To Clinton A. Carlton.

38. Q. Was this disclosure made to Mr. Carlton before or after he left the employ of the Republic Rubber Company?

A. Before.

39. Q. How long before?

A. Shortly before.

40. Q. Do you remember when he left?

A. In March of 1918.

By Mr. Wooster:

I would like to call Mr. Carlton now as a courtesy, to enable him to get back to his office tomorrow.

By the Court:

All right; we will allow you to do so.

(Witness withdrawn for the present).

CLINTON A. CARLTON, a witness called on behalf of plaintiff, having been duly sworn, testified as follows:

DIRECT EXAMINATION.

By Mr. Wooster:

1. Q. Please state your name, age, residence and occupation.

A. Clinton A. Carlton; twenty-nine; Mansfield, Ohio; chief chemist of the Columbia Tire & Rubber Company.

2. Q. How long have you been connected with that company?

A. Approximately three and a half years.

3. Q. With whom were you employed previously?

A. Previously with Kelly Springfield Tire Company.

4. Q. Where were you educated?

A. University of Akron.

5. Q. After you left the university, where were you employed?

A. Republic Rubber Company.

6. Q. Between what dates were you employed at the Republic Rubber Company?

A. I went with the Republic just after graduation, which I think was the first week of June, 1917, until approximately the latter part of March, 1918. I don't remember whether it was the latter part of March or first of April; it has slipped my mind.

7. Q. After you left the Republic, what did you do?

A. Returned to the University of Akron.

8. Q. While with the Republic, what was your position?

A. Well, when I first went to the Republic I went there as organic chemist, but shortly after I took up my duties there, I was given charge of the chemical department upstairs. The laboratory was divided into two distinct divisions, one the physical or routine division and the other mechanical work, which includes control work, and what research we could do at the time.

9. Q. Just previous to your leaving the Republic, what was your position?

A. Well, I had complete charge of all the chemical work, strictly chemical work.

10. Q. What did that include?

A. It included usually control analysis of all incoming materials, checking the compounds that were cured in the laboratory, for instance, testing rubber shipments and in addition to that, of course, directing the work along the lines of accelerators and organic preparation work. We also did considerable experimental work, compound testing out of different new materials.

11. Q. Did you have any assistance in the work on accelerators?

A. Yes. Weiss worked for me. I cannot remember exactly when he came with the Republic—the latter part of 1917. He worked on analytical work for a very short time. Then he was turned over,

that is, I put him on organic work, assisting me in the work of organic preparations.

12. Q. You mean Morris L. Weiss, who is here present?

A. Yes, sir.

13. Q. And who preceded you on the stand?

A. Yes, sir.

14. Q. Did Mr. Weiss ever disclose any conception of his as to rubber accelerators?

A. Of course, at the time Weiss came to the Republic, he knew practically nothing about rubber, but after we started work on the organic accelerators, of course it was one of my duties to teach him as much as possible about organic compounds and their use in rubber as accelerators, and after he had gotten started in the work and began to learn what an accelerator was, naturally he had ideas as to what might be possible to try, as we were continually searching what little literature we had at the time—laboratory facilities at the Republic were extremely limited, and a great many of the things we were trying were things I had jotted down before I came with the Republic, from time to time, not meant as accelerators but simply organic compounds that might have possibilities.

15. Q. Did Mr. Weiss mention any to you?

A. He did.

16. Q. Do you recall the names of any?

A. I remember distinctly one thing that he called to my attention. We had an old Richter organic chemistry book. At that time we were working in a general way on guanidines, and of course at

that time I knew of T. P. G. as an accelerator. I had tested that before I came with the Republic. I wasn't particularly interested in it at that time. I was more interested in the time in possible guanidine derivatives that might be had from dicyandiamid, because that was a product that could be obtained and offered possibilities of obtaining a good derivative or organic compounds. But in this Richter there was mention made of a very few of the guanidines, D. P. G. being one of these. And as I remember it, this occurred just shortly before I left, I imagine a week or so. I left rather suddenly on account of the war. I went back to the University and went into the service at the University, in the War School there. He mentioned that these various substances might be tried, naturally from the fact that T. P. G. was already known as an accelerator, and I remember that in our last discussion which we had before I left—I don't remember whether Mr. Daniels was present or not—that the guanidine class of the thiourea. would probably be as good a field to work in as any, that is, to continue his work.

CROSS-EXAMINATION.

By Mr. Edmonds:

X17. Q. Do you recall when it was that you got this idea that the guanidines would be a fruitful field to work in?

A. Only from the fact that T. P. G. was known; that is all. At that time I think T. P. G. was the only substance that I knew anything about that had been tried, and I tried that and worked on that

at the Miller Company before I went with the Republic.

X18. Q. And back there in the days when you were with the Miller Company, you thought this whole field of guanidines would be a fruitful field to search through, particularly as you knew T. P. G. was a good accelerator.

A. Well, to make a specific statement to that effect, only in so far that you had a substance in one particular class that had proven to be an accelerator, it would be well to work on other derivatives.

X19. Q. It would be worth while to try others to see if they were better?

A. Why, certainly; always looking for something better than we had before.

X20. Q. Did you do anything in the way of trying either of them?

A. I did not myself. I remember we had dicyandiamid to work, on what derivatives we had to work from, that being raw material, but so far as having prepared any other guanidines, when I was with the Republic we did nothing. The main part of our work at that time was trying to put into the production one of the newer compounds known at the time.

X21. Q. Did you talk with any other members as to trying the use of this?

A. Do you mean Mr. Daniels?

X22. Q. Yes.

A. I suppose we did. Mr. Daniels and I used to have conferences in his office once a week.

X23. Q. And it was your idea to try other members of the guanidines?

A. Naturally we had little time to spend on that one particular subject, but that was my prime object, outside of routine work, to spend all of my time on organic accelerator compounds.

X24. Q. And the only way you could find out was to put some in a rubber compound and make a test and examine them?

A. Yes.

X25. Q. But before you got around to performing these tests yourself, you left the Republic?

A. Well, I did try other compounds not in the guanidine list, a few phenyl thioureas.

X26. Q. You had in mind that you would try other members of the guanidine group, but before you got around to it you left the Republic Company?

A. Yes.

X27. Q. But shortly before you left the company, one time when you and Weiss were discussing accelerators, and you had Richter in front of you, or one of you opened Richter to the page where T. P. G. appeared, and in the course of that discussion Weiss stated that it might be worth while to try D. P. G. to see if that would be an accelerator?

A. The exact case as to how it came about, Weiss had evidently been going through Richter, either at the plant or at home, and had noticed this, and had brought the book to me, but whether or not that is on the same page as T. P. G. I couldn't state; I haven't any idea.

X28. Q. And he said to you that maybe this D. P. G. will be a better accelerator, and you said "Maybe it will; we had better try it?"

A. Yes.

X29. Q. That is the substance of it?

A. Yes, that is true.

X30. Q. Have you read any part of your testimony that you gave in the National case?

A. No, I haven't.

X31. Q. Before going with the Republic you were with the Miller Rubber Company?

A. Well, I might explain that so there won't be any mistake. I worked for the Miller Rubber Company in my vacation in my junior year, and afternoons and Saturdays during my senior year; so that I worked with the Miller Company and went to school at the same time. But upon graduation I went directly to the Republic.

X32. Q. That was in June, 1917?

A. Yes.

X33. Q. In the National case, in one part of your testimony, you said, "It is well known that the length of time a compound is cured, other things remaining equal, the longer the stock is cured, the lower are its physical properties at optimum." You don't wish to make any change in that statement?

A. No, I believe that is true.

X34. Q. When did you learn that?

A. Well, from the very beginning. One of the things that we had to do at college—I took a course in rubber chemistry while at the University, and those various things were brought out. At the time I made that statement, it was generally recognized that heat effect upon rubber is deleterious, and that

is just a general statement that the longer stock is cured the lower will be its physical properties.

X35. Q. And that is a fact that all of the members of your class learned in college?

A. In addition to the practical experimenting.

X36. Q. I say, that statement of fact there about the curing of rubber is a statement that you and your classmates learned in college back there in 1917?

A. Yes.

X37. Q. It was true then, and has been true ever since, and has been known to all rubber chemists?

A. Yes, in a general way. Perhaps you would only differentiate in time by a few minutes, one substance might show different, but over long periods of time, so if you would change a compound from a four-hour cure to a two-hour cure, that the two-hour cure would be the optimum.

X38. Q. You recited the same thing here, that heat itself has a deleterious effect upon rubber?

A. Yes, sir.

X39. Q. That is true, as a general statement, about vulcanization?

A. I think so.

X40. Q. And that you learned in college, and your classmates learned it with you?

A. I won't say I learned all these things in college. I might have learned these things after I left college. These things are common knowledge.

X41. Q. And it was common knowledge back there in 1917?

A. There wasn't as much proof behind it at

that time as there is now, but it was recognized as a fact.

X42. Q. Now, an accelerator, of course, hastens the operation of vulcanizing, and therefore as a result of having an accelerator in the mix, the vulcanization may take a less length of time?

A. True.

X43. Q. And because it takes a less length of time, that is, because the compound is subjected to heat for a less length of time, the physical properties are better?

A. That is one of the factors which increases the physical properties.

X44. Q. Carrying the matter a little further, you said in your testimony in the other case, "You can make better stock with D. P. G., I believe, than it is possible to make with T. P. G., just simply for the reason that the stock or compound does not have to be heated for such a length of time?"

A. In general, that is true.

X45. Q. You have no reason for wanting to alter that? That is just the same as you understood it then?

A. Absolutely.

REDIRECT EXAMINATION.

By Mr. Wooster:

46. Q. In that same answer from which the last answer was quoted, did you not also say, "Tensile is higher, which is the main thing" (reading from page 380 of the National record, and just immediately

opposite the answer quoted in the last cross-examination)?

A. Yes, that statement was made there. Tensile is higher, which is the main thing. I don't know that statement could be changed a little. Nowadays there is a great deal more known about their physical properties. Tensile is extremely important in some particular compounds, but at the same time there are other properties which are even more important than tensile for specific uses, but tensile is one of the indications of the high quality of the compound.

47. Q. At the time you left the Republic, do you recall the names of any of the substances which were on the list to be tested for accelerating possibilities?

A. I don't know as we made out an actual list; I couldn't say as to that or not, but I do remember that during the last week I was at the Republic, as I have stated before, that the guanidine class or the thiourea was a good field to work in. I had very little time to discuss the matter with Weiss, as to what he should proceed to do, or even with Mr. Daniels, as I was, I think, to leave within two or three days of the time I actually left.

48. Q. Do you recall the names of any other specific materials other than you have given?

A. You mean, that we had already tested out or had in mind?

49. Q. That you had already either fully tested and rejected or accepted, or had partly tested, and had arrived at no conclusion on, or those that were still to be tested?

A. Well, since that time I have done so much on accelerators, tested so many, that it would be rather difficult to state. I remember that we tested out phenyl thiourea. That was one of the things that showed promise, the objection to that being its expense. It was small in comparison to hexa. Among other things, I remember I had in mind to try ethylenediamin. As I stated previous to this time I was more interested personally in aliphatic compounds than I was in aromatic. I have learned since that I was mistaken, but I had always been interested in the derivatives of compounds that could possibly be prepared from dicyandiamid. Dicyandiamid was a chemical product at the time, and there was a great many compounds that could be prepared from it, many of which have been prepared since that time.

By Mr. Edmonds:

50. Q. Would a compound of 50 parts of rubber, 45.5 of zinc oxide, 3.5 sulphur, 1 part D. P. G., have what you would consider a flat curing curve?

By Mr. Wooster:

I think that is outside the direct testimony.

By the Court:

I do not think we will go into that, because this witness was not called as an expert.

By Mr. Edmonds:

If I can show that this witness contradicts another witness, I think I should be permitted to do it.

By the Court:

No, you can contradict that witness by your own witness.

MORRIS L. WEISS, recalled, testified as follows:

DIRECT EXAMINATION (Continued)

By Mr. Wooster:

41. Q. Do you recall any specific substances which were to be tested at the time Mr. Carlton left?

A. Well, I prepared the phenyl thiourea for him. He ordered some dicyandiamid, and there was T. P. G. to be tested, and I had in mind a few others I was going to prepare.

42. Q. I am asking you to give the names of all the substances you prepared, which were either on the written or oral program to be tested at the time Mr. Carlton left the Republic. Can you recall any substances?

A. There was no list made out then to be tried, and I mentioned some of them; the D. P. G. was to be tried when I had it made.

43. Q. Do you remember any others that were to be tried either when made or bought in the market, or taken out of stock already in the place?

A. Yes, there were a few there, like paraphenylenediamine and faranitrosodimethyl analin, and there was formaldehyde analin.

44. Q. Any others?

A. Yes, paratoluolsulphamid and paradiaminodiphenylmethane.

45. Q. Which of the substances you have mentioned were subsequently prepared and tested, to your knowledge?

A. Formaldehyde analin; T. P. G.; parotuluol-

sulphamid and paradiaminodiphenylmethane; I also tested dicyandiamid, which I got in; and paranitrosodimethyl analin.

46. Q. What next did you have to do with D. P. G. after Mr. Carlton left?

A. Well, the description was rather meagre in the way of giving a method of preparation, and I had no idea how to prepare it, so I went down to the library in Youngstown there, and searched for the method of preparing D. P. G. There is a public library there. And in May of 1918 I went down there and found several volumes of reference works by Roscoe and Schorlemmer, and in one of the volumes I found a description of the physical and chemical characteristics of D. P. G., also a brief description of some of the methods of preparing the same, and also references to the original literature of which this was abstracted. I copied that information on a piece of notepaper.

47. Q. What next did you do?

A. Well, I did not start on the preparation of P. D. G. immediately, for the reason that I was planning to spend my vacation in New York City the following month, and I decided while in New York City to get some more information, or all the possible information I could get, on methods of preparing D. P. G., in the New York Public Library, as the information contained in the Youngstown Library was rather of an abstract nature.

48. Q. Did you go to New York, and when?

A. Yes, I went to New York in June of 1918.

49. Q. Did you find any additional information on the method of preparing D. P. G.?

A. I did find a more detailed description of one method of preparing D. P. G.

50. Q. What did you then do?

A. Why, I returned to Youngstown.

51. Q. Then what did you do?

A. Why, I immediately upon my return—I was busy in purifying paraphenylenediamine, in which Mr. Munroe H. Daniels, chief chemist, was interested. I devised a small laboratory in order to purify the product that way, which I did.

52 Q. After Mr. Carlton left, under whose direction were you?

A. Under Mr. Munroe H. Daniels, chief chemist.

53. Q. What else were you doing during the summer of 1918?

A. Well, I was given charge of the analytical laboratory when Mr. Carlton left, and all the work done there of an analytical nature was under my direction, and any spare time I devoted to preparing and testing out certain organic compounds and accelerator vulcanization, outside of other problems of a research nature, like the purification of paraphenylenediamine.

54. Q. Did you make any D. P. G.?

A. Yes.

55. Q. When?

A. I started the preparation of D. P. G. in September, 1918.

56. Q. About how much did you make?

A. Why, by the time I got through with the

first two experiments, one of them being discarded, I got about five grams of D. P. G.

57. Q. What did you do with that?

A. I compounded it in a rubber compound, to try out its activity to find out what it would do with the rubber.

58. Q. When was that done?

A. In December of 1918.

By Mr. Edmonds:

59. Q. The compounding was done in December, 1918?

A. That is right.

60. Q. When did you get the five grams?

A. By the end of November, I judge the compounding was really started the first week in December, as I remember.

By Mr. Wooster:

61. Q. Was there any record made of the manufacturing of the D. P. G., and of the first compounding of it with rubber?

A. A record was made for the actual preparation of D. P. G., the compounding of D. P. G. No written record was made at this time of the results obtained in compounding D. P. G. with rubber.

62. Q. What were the results of the first tests of D. P. G. compounded with rubber?

A. Why, the first slab of rubber compounded by the use of D. P. G. was overcured.

63. Q. When was this?

A. This was in December of 1918.

64. Q. What was the formula?

A. The formula was the regular standard rubber accelerator test recipe, which consisted of 50 parts of pure rubber, 4 parts of sulphur, 2 parts of magnesium, 1 part accelerator, 43 parts zinc oxide.

65. Q. What was the cure?

A. The cure was 50 minutes at 40 pounds, was the first cure I gave it.

66. Q. Did you do this work entirely yourself, or did you have assistance?

A. Why, I weighed out the rubber, the sulphur, the accelerator, but the actual cure was done in the experimental mill room, and the mixing in the cure.

67. Q. In your presence?

A. The mixing was done in my presence.

68. Q. How about the curing?

A. The start of the curing was done in my presence, as the rubber was put in the press and the steam turned on, and then I went back to the laboratory, and I was generally called back when it was time to take the rubber out of the press.

69. Q. Who did the curing?

A. Mr. William Holliday.

70. Q. After obtaining this first overcure with D. P. G., what did you next do with it?

A. I told him to cure another slab of rubber with the same compound, for 40 minutes, at 40 pounds, and see what he would get then?

71. Q. Was that done?

A. Yes.

72. Q. What was the result?

A. It was overcured.

By Mr. Edmonds:

73. Q. When was that second one?

A. That was in December of 1918.

By Mr. Wooster:

74. Q. What formula?

A. Why, the same formula and the same rubber stock as I used for the first cure.

75. Q. How did you tell that these stocks were overcured?

A. By cutting a strip off the finished cured rubber slab and pulling it. The strip of rubber broke immediately, showing it was overcured. Also, by the feel or snap of it, and from the way it came back.

76. Q. Was the second cure as much overcured as the first?

A. Why, it was pretty well overcured. It was hard to tell to what degree the overcure was.

77. Q. What did you do then with D. P. G.?

A. I then asked Mr. Holliday to cure another slab of the same compound for thirty minutes at forty pounds.

78. Q. Did he do it?

A. Yes.

79. Q. When?

A. Soon after the second cure was obtained, in December of 1918.

80. Q. What was the formula of this cure?

A. It was a slab of the same stock originally prepared, and from which all of these cures were made.

81. Q. What was the result of this third cure?

A. It was also overcured.

82. Q. How much, in comparison with the two previous ones?

A. Why, it was difficult to tell to what degree the overcure was, even at that stage, but it showed a definite overcure.

83. Q. Up to this time did you consider these results encouraging or discouraging?

A. I considered them indicative and encouraging; indicative of the fact that D. P. G. was a powerful accelerator, and encouraging because of that fact that I might produce a good rubber by the use of this accelerator.

84. Q. What became of the records you referred to a few questions back as being made at this time?

A. You mean the process?

85. Q. No, with reference to these cures.

A. Why, the slabs of overcured rubber I kept on my desk. I made no written record of it at the time, a reference to these cures.

86. Q. What did you next do with D. P. G. after making this third cure from the original batch?

A. Why, I had no more of the original batch left; it was all used up. So I immediately started on the preparation of some more D. P. G. In preparing D. P. G. at this time, I gained some experience from my two attempts in preparing it, by observing the conditions under which the first two experiments were prepared, and reasoning out from the materials, reacting ingredients that enter into the synthesis of D. P. G. Now, in my first two attempts I used the alcoholic solution of ammonia, and attempted to

dissolve in it thiocarbanilide. I then used letharge to desulphurize, heating the solution at the same time to boiling, while stirring with a glass rod. Now, in this third experiment I realized that ammonia is one of the most important reacting ingredients in this synthesis, and since ammonia was volatile at reaction and temperature, in my succeeding experiment I would either have to use quite a large excess of this ammonia or reduce the temperature of the reaction, and include both conditions in my following experiment. This I did. I used twice the volume of alcoholic ammonia used in the previous experiment, and I desulphurized thiocarbanilid at a lower temperature. In this experiment I obtained a larger yield than I did in the previous two, but not as satisfactory a yield, even from a laboratory point of view.

87. Q. What did you do with the D. P. G. thus obtained?

A. Why, I compounded it into the rubber, using the same recipe I used in compounding the D. P. G. previously obtained, and subjected this compound to vulcanization, in order to arrive at an optimum cure.

88. Q. Did you make the optimum cure the first time you tried?

A. No; the next cure.

89. Q. What was the time and pressure used in this first cure, with the second lot of D. P. G.?

A. I cured one slab for thirty minutes at thirty pounds, and I found that was still overcured, although not to as large an extent as the other cures were, obtained by the first batch of D. P. G.

90. Q. Then what did you do?

A. I cured another slab for twenty minutes at thirty pounds. And I found that this was just about cured up.

91. Q. What was the formula?

A. Why, this slab was taken from the same batch of rubber as I did the previous batch, and the formula of it was 50 parts of rubber, 43 of zinc oxide, 2 of magnesia, 4 of sulphur, 1 of accelerator and one was D. P. G.

92. Q. What was the result of this test?

A. This cure was just about right. I then cured still another slab of the same rubber batch for fifteen minutes at thirty pounds, and I found this to be slightly undercured. I then had this slab of cured rubber tested in a physical laboratory provided for this purpose, and when this was done I obtained a report of the physical tests of the slabs, which showed me that a twenty-minute, thirty-pound was about the right cure. And this test I recorded in the "X" book, a book provided for this purpose in the laboratory, which was kept by me and was in my care.

93. Q. Prior to what date, as you recall, were the unrecorded overcures and the last under-cure tests made?

A. Well, it was prior to the first of the year 1919, when the first overcures were made.

By Mr. Edmonds:

94. Q. Were all three cures made before January 1st?

A. Are you referring to the last three tests or the previous three tests?

By Mr. Wooster:

95. Q. You had several overcures with batches of D. P. G., and I asked you prior to what date were those made, and also the final undercure, with the second batch of D. P. G.

A. My answer is correct.

By Mr. Edmonds:

96. Q. It isn't clear in my mind yet. You have told about making the first slab that was overcured and the second slab that was overcured, and the third slightly undercured. Do you say that all three of these were made before January 1, 1919?

A. No.

97. Q. That is what I understood you were asked.

A. Was that the question?

By Mr. Wooster:

98. Q. Yes.

A. I misunderstood that. These three tests were made some time at the end of January, 1919, and at the beginning of February, 1919, and they were made one after another, that is, probably in a week or so.

99. Q. You mentioned a D. P. G. test which was the first one of which record was made. When was that record made.

A. On February 10, 1919.

Here Court adjourned until tomorrow morning at 10 o'clock, A. M.

Thursday, October 8, 1925.

MORNING SESSION.

MORRIS L. WEISS resumed the stand.

EXAMINATION (Continued)

By Mr. Wooster:

100. Q. At the time of adjournment yesterday you had just mentioned that you recorded your first successful test in the "X" book. Prior to this successful test, did or did you not discuss your work on D. P. G. as a rubber accelerator with anyone else, and if so, give the names.

A. Just before Mr. Clinton A. Carlton left, I pointed out to him that I found guanidine, and told him that we might try this compound, and he agreed with me. When I started to prepare D. P. G. in September of 1918, I spoke to Mr. Munroe H. Daniels, the chief chemist, and told him that I was starting to prepare D. P. G., and I was going to test it as a rubber compound, to see if it was an accelerator. After completing the tests in December of 1918, I showed the rubber slabs, which were cured with D. P. G., to Munroe H. Daniels, chief chemist, and told him of the results that I obtained, and also told him that I was starting to prepare some more D. P. G., in order that I might arrive at an optimum cure with the same.

101. Q. You said Mr. William Holliday made the first cures with D. P. G., which were overcured. Did or did you not tell Mr. Holliday what the ac-

celerator was in this batch of rubber which you first gave him, containing D. P. G.?

A. I do not recall that.

102. Q. Did you afterwards tell Mr. Holliday what accelerator you were using?

A. I told him after I got the optimum cure that that was diphenyl.

103. Q. Diphenyl—what?

A. That is all I told him.

104. Q. When did you tell him that?

A. When I completed the tests in the beginning of February, 1919.

105. Q. Will you please look at the book I show you, and if you recognize it, state what it is.

A. That is the book that I kept at the laboratory, in which I recorded compounding experiments.

By the Court:

106. Q. Is that the book called "X?"

A. Yes.

By Mr. Wooster:

There being another "X" book to be referred to by other witnesses, this book here produced will be referred to as the "2,000 'X' book," and the other book to be later referred to by other witnesses will be the "1700 'X' book."

These books and other records of the Republic Rubber Company are brought here by Mr. Nellen, of the Lee Tire & Rubber Company, the successor of the Republic Rubber Company, and it is asked that photostats of these records may be used in place of the originals, so that

Mr. Nellen may return these records to his files.

107. Q. In addition to this "X" book, were any other records kept of your work on D. P. G. at the Republic Rubber Company?

A. Outside of my personal notebook, no other records of experiments with D. P. G. were kept there.

108. Q. What became of your personal notebook?

A. My personal notebook I used while engaged in the manufacture of D. P. G. in 1920 and 1921, at the plant, and the plant burned down to the ground in 1921, and that notebook was destroyed in the fire.

109 Q. What happened to the samples of rubber which you have testified you made in the latter part of 1918 and the first part of 1919?

A. Those samples I kept on my desk at the Republic, and I took some of them with me when I left there, and when I got to New York I kept them at my house for some time, and then lost sight of them. I didn't know what became of them then.

110. Q. Whose plant was it that burned down in the fall of 1921?

A. The plant of the Dovan Chemical Corporation.

111. Q. Will you please look at the 2000 "X" book, and state whether or not you find any record in it of your work with D. P. G. This book will be marked for identification as Plaintiff's Exhibit No. 2.

A. I do.

112. Q. Please point out those records in full,

giving them in chronological order as far as you can.

A. Here is a record recorded on "X" 2034-E, which is the first successful experiment recorded with the use of D. P. G. The compound consisted of 50 parts of rubber, 1 of D. P. G., 4 of sulphur, 33 of zinc, and 2 of magnesium; vulcanized for 20 minutes, 30 pounds steam pressure; gave a stretch of 14½ inches; tensile strength, 3,000 pounds; a set of ½; recorded on February 10, 1919.

The next experiment was recorded in "X" 2006-G, and consisted of a standard shoddy accelerator recipe, which in this case was 94 parts of "C" shoddy, which is reclaimed rubber; 1 part of lime, 3 parts of sulphur, and 2 parts of D. P. G. There is no record here of the physical properties of this compound, nor the date of it, but there is a note here indicating that it was cured, and the note reads, "Overcured, too much accelerator." This test was made just immediately after the successful tests on the pure rubber, zinc, and so forth, recipe, which was reported on February 10, 1919. This test was made in comparison with a similar test made on July 26, 1918, with T. P. G., and recorded on "X" 2006, column "B."

The next experiment with D. P. G., is recorded on "X" 2006, column "H." This experiment was made with a recipe consisting of 70 parts of "C" shoddy, which is reclaimed rubber, 5 parts of brown crape, which is live rubber, 1 part of lime, 4 parts of sulphur, 2 parts of D. P. G., and 18 parts of barytes. This compound was vulcanized for fifteen

minutes at thirty pounds steam pressure, and gave a stretch of 10¼ inches, tensile strength of 720 pounds, and a set of 5/8, and was recorded on the 21st of February, 1919.

113. Q. Before proceeding further with your answer as to further pages of this "X" book, in connection with the pages previously mentioned by you, and those to be mentioned later, please give in each answer as to each page, in whose handwriting the entries are made which you are reading into the record, and when they were made.

A. The entries I just read were made in my own handwriting, and immediately after I obtained the report from the physical testing laboratory on those compounds referred to. The compound that was not tested in a physical testing laboratory was tested by myself was entered immediately after I made such test; that is, by pulling and feeling it with my thumbs.

The next experiment made with D. P. G. was recorded in my own handwriting, and immediately after I obtained the report of the physical testing laboratory on this compound, in "X" 2042, column "A." This compound, as well as the one recorded on "X" 2006-"H," on February 21, 1919, was a practical factory compound actually used at the plant. This compound consisted of 68 parts of "G" shoddy, which is another grade of reclaimed rubber, 10 parts of hydrolene, which is a pitch, 3 parts of turps, which is crude turpentine, 12 parts of fossil flour, 1½ parts of inertia, which is a lampblack, 2½ parts of lime, 2½ parts of sulphur, and 1 part of D. P.

G. The specific gravity of this compound was 1.60, and was cured for twenty minutes to 274 degrees Fahrenheit, and has a strength of 3½, a tensile strength of 650 pounds, and a set of ⅛. It was recorded on the 4th of March, 1919. This test was made in direct comparison with the actual recipe that was used at the plant at that time, and in which one part of letharge was used instead of one part of D. P. G. Otherwise, the recipe is identical and the specific gravity of that compound was 1.64, showing it was heavier. The cure on that was 38 minutes at 274 degrees Fahrenheit, the stretch was 3½ and the tensile strength was 530 pounds, and the set was ⅛. It was recorded on the 4th of March, 1919, showing it was done at the same time.

114. Q. What was the purpose of making up this compound of turps, fossil flour and the other things mentioned?

A. The Republic Rubber Company had an extensive mechanical rubber goods department, and they were making various mechanical rubber goods, such as baby cab tires and washers and plumbers' supplies, and rubber goods and bumpers and steam packing and rubber hose and in all these compounds which are necessary, inexpensive—cheap—a good deal of reclaimed rubber is used, and the Republic Rubber Company was manufacturing a good deal of the reclaimed rubber they were using, and there was a good deal of interest there in finding an accelerator that would work well with this reclaimed rubber, so that they would get a better compound; that is, a compound that would have a good tensile strength

compared with what they were getting at that time. So these tests were made to see what this accelerator would do, in this shoddy or reclaimed stock, the mechanical goods stock, and for this purpose I tested it out and I found guanidines, and naturally the factory recipe was used at that time, in order to see what it would actually do.

115. Q. Proceed now with further "X" book records, if any, of D. P. G. compounds.

A. Here is a test made of D. P. G. with a compound actually used at the plant, which was steam packing, and here also I wanted to see what D. P. G. would do in the way of improving the quality of this compound. That is recorded in "X" 2010, column "H," in my own handwriting, and the record was made immediately after getting the physical test report from the physical testing laboratory. This compound consisted of 40 parts of batanga, which is a poor grade of rubber, usam—which stands for a shoddy, a trade name for shoddy or reclaimed rubber—11 parts, 15 parts of zingu—which is a good grade of rubber—2 parts of lime, 3 parts of sulphur, 27½ parts of zinc, 1½ parts of inertia, which is a lampblack, and 1 part of Diffendoe," which I used at that time instead of writing out diphenylguanidine —I used this code name.

116. Q. Where did you get these factory compounds which you have referred to in these "X" book tests?

A. From the compounding chemist.

117. Q. Who was that?

A. This recipe I got from Mr. Nellen, who was

the compounding chemist for the mechanical rubber goods department.

118. Q. Why did you get it from him?

A. I talked with him about my work in D. P. G. late in the summer of 1919, and I told him that I had a quantity of pure D. P. G., and I wanted to test it out in as many factory recipes as possible, to show its utility, and I would like to get some compound from him that was used in the mechanical rubber goods department. He gave me this recipe as well as another one for valve stock, that is, a semi-hard rubber valve used in steam valves.

119. Q. Do you recall when you first disclosed D. P. G. as an accelerator in the vulcanization of rubber, to Mr. Nellen?

A. I do. It was some time in August, 1919.

120. Q. Have you any way of fixing that date?

A. It was a few months after he came back to the Republic, as he was away for some time, and I talked to him at his desk. It was pretty warm, and I remember I had my coat off, and that was the time I talked to him about it. That is as near as I can fix the date.

121. Q. Did you ever test any recipe given you by Mr. Nellen with anything else but D. P. G.?

A. Yes.

122. Q. When and with what?

A. With T. P. G. This test was made with the same recipe that I got from Mr. Nellen, and is recorded on "X" 2010, column "G," and is the left-hand page opposite 2010 "H" mentioned just previously. This recipe I got from Mr. Nellen to test D. P. G. I also tested T. P. G. in it, and it was my intention to

test both at the same time. So I compounded the first and for some reason, which I do not now recall, I did not compound D. P. G. at the same time, most probably being called away for some other work, and this test with T. P G. went through before I compounded D. P. G. in the same recipe, which is recorded on "X" 2010-"H." Now, the cure on the compound recorded in "X" 2010-"H," and compounded with D. P. G. was for thirty minutes at thirty-five pounds' pressure, and gave a stretch of 14½ inches, a tensile strength of 2530 pounds, and a set of ½, and recorded on the 29th of September, 1919, in my own handwriting, and immediately after, or soon after, I got the report from the physical testing laboratory on this compound.

Now, the experiment made earlier with T. P. G., is recorded on "X" 2010-"H," the left-hand page facing the page on the right-hand which is also 2010. This recipe consisted of 15 parts of brown crepe, which is a good grade of rubber, 40 parts of batanga, 11 parts of usam, which is the shoddy, 2 parts of lime, 3 parts of sulphur, 27½ parts of zinc and 1 part of "Trifan," which is T. P. G., and ½ part of inertia. This compound was cured for 40 minutes at 40 pounds' steam pressure, and had a stretch of 14 inches, a tensile strength of 1605 pounds, a set of 3/16, and was recorded on September 6, 1919, in my own handwriting, soon after I got a report on this from the physical testing laboratory.

123. Q. Where did you get this formula used in "X" 2010-"H," of September 6, 1919?

A. This is the formula that I got from Mr. Nel-

len, in order to test out D. P. G., to see how it would work in this formula.

124. Q. From where did Mr. Nellen come back?

A. He was in the Army, Chemical Warfare Service.

125. Q. Do you recall when he came back?

A. Yes; he came back in the spring of 1919, late in the spring of 1919, or early in the summer of 1919.

126. Q. Will you now compare the test on Trifan, "X" 2010-"H," of September 6, 1919, with the test on Diffendoe, "X" 2010-"H," of September 29, 1919, and state what those figures tell you as to the action of T. P. G. and D. P. G. on those compounds. I have referred to two columns "H." The first one means the left-hand page, and the second "H" means the right-hand page.

A. The compound vulcanized with D. P. G., recorded on the 29th of September, 1919, was vulcanized in a shorter time and at a lower temperature or steam pressure, had a better stretch and a much better tensile strength, and the amount of accelerator used in both compounds was the same. Now, this test of September 6, 1919, I got before I made this test with D. P. G. on September 29, 1919, and noticing the low physical properties I got on this compound, I made another comparison at the same time I compounded D. P. G. in this recipe, with T. P. G., using a larger quantity of T. P. G. This experiment is recorded on "H" 2010-"H," right-hand page, and consisted of 40 parts of batanga, 11 parts of usam, 15 parts of brown crepe, 2 parts of lime, 3 parts of sulphur, 26½ parts of zinc, 2 parts of T. P. G. and half a part of inertia. The cure on that was 40 minutes, at 40 pounds' steam

pressure, the same I had in the experiment reported on September 6, 1919. The stretch on this was 13¾, the tensile strength was 2105 pounds, the set was ½, and it was recorded in my own handwriting on September 29, 1919, soon after I got the physical test report from the physical testing laboratory.

127. Q. Up to September, 1919, had you considered D. P. G. as an accelerator in the curing of rubber, for anything else than the compounds you have mentioned?

A. I don't quite understand what you mean by that question.

128. Q. Have you named all the compounds in which D. P. G. was to be used as an accelerator?

A. To be used?

129. Q. Up until September 1, 1919.

A. Yes; I mentioned all the compounds in which I found guanidine was used.

130. Q. I do not mean all in the "X" book. Did you have any others in your mind, up to September, 1919?

A. Yes.

131. Q. What?

A. I reported or made tests with D. P. G. of various purities. In the experimental work in getting D. P. G. it wasn't always obtained in a pure form, and it required purification. Now, it occurred to me to test D. P. G.'s containing these impurities, which are manifested by the lowering of the melting point, as a pure chemical generally has a sharp melting point, and any impurities that may be present generally lower the melting point. Now, it was my idea to see what these several D. P. G's, obtained from

several experiments, that had different melting points, to see what results I would get in the rubber by actually testing those, that is, compounding a number, and see what results I would get. This I did late in the summer of 1919.

132. Q. You misunderstood the question. I am asking you if, prior to September 1, 1919, you had any other compounds in your mind, to use D. P. G. in, that are not in the "X" book pages you have referred to?

By Mr. Edmonds:

That is objected to on the ground that it is utterly immaterial. What this witness says now from memory that he had in mind six years ago, it seems to me would be utterly valueless.

By the Court:

It might be admissible. We will allow that question to be answered.

A. I purified some hundred grams of D. P. G. some time in August of 1919, and it was my intention to make tests of that purified D. P. G. with a number of factory recipes, to see what D. P. G. would actually do in the way of improving the rubber compound.

133. Q. Can you give any other factory compounds in which it was contemplated to use D. P. G., other than those you have given?

A. Yes. I was planning to test that in the pure gum, inner tubing, to test it in a friction stock, friction for belting or friction stock for tires, and also I was planning to test it in a hose stock; that is, the rubber covering the hose, and the valve stock and a

number of other stocks that I would get from time to time.

134. Q. Were any other uses for D. P. G. in rubber compounds suggested to you?

A. Oh, yes.

135. Q. What?

A. I remember that distinctly. It was in the summer of 1919, and after I told Mr. Daniels that I had prepared D. P. G. and after I tested it I found guanidines, and I had some of that left. I told him that if he would want to have that tested by himself and in some of his own compounds, I would let him have some of the D. P. G. Now, it was in the summer of 1919 that he told me he would like to test out D. P. G. in an inner tube splicing cement, that is, a compound used in splicing inner tubes, that is, putting both ends together and sealing them up. I told him "Fine!" And he told me that I should give some of this D. P. G. to William Holliday, who was in the experimental mill room, doing the work there, and that he would use that in compounding the splicing cement. This I did, and it seems that they used that up quickly, because he came back for another portion of D. P. G., which I gave him.

136. Q. How do you fix that date as the summer of 1919?

A. It was after I came back from Pittsburgh, where I visited the Carnegie Institute Library and got some more information on the methods and also on the theoretical considerations of D. P. G., and after I made a number of experiments duplicating or verifying the methods recorded in the literature, several months, or three months after I made the tests with

D. P. G., and recorded, in this "X" book, the first few tests that I made.

137. Q. Did you finish your comparison of the T. P. G. test on "X" 2010, left-hand page, and the test on the right-hand page of the same number?

A. No.

138. Q. Please finish that answer?

A. There were two compounds with T. P. G. made up at that time, in comparison with the one of D. P. G. recorded on "X" 2010-"H," right-hand. The first one, which has already been referred to, is recorded on "X" 2010, column "F," right-hand, while the second one in comparison is recorded on "X" 2010, column "G," and consisted of the same recipe as the one in column "F," with the exception that no lime was used, and instead of two parts of lime, two parts of zinc were added to the zinc already used. Now, this compound was cured also for forty minutes at forty pounds' steam pressure, and gave a stretch of 13¼, a tensile strength of 2075 pounds, and a set of 9/16. That was recorded in my own handwriting on September 29, 1919, as soon as I got the physical test report from the physical testing laboratory.

139. Q. Please now continue with the experiments shown in the "X" book on D. P. G., subsequent to the one you have just referred to, and continue the same answer.

A. The next is 2064, column "D," where the experiment is recorded, which consisted of 50 parts zingu, 1 part Diffendoe, which is D. P. G., 4 parts of sulphur, 43 parts of zinc, and 2 parts of magnesia. This compound was cured for thirty minutes at thirty

pounds' steam pressure, and gave a stretch of 14 inches, a tensile strength of 2790 pounds, and a set of 3/8. It was recorded in my own handwriting on October 3, 1919. This experiment was carried out in comparison with another one in which 1 part of lime was used instead of 1 part D. P. G., and that 1 part of lime was recorded on "X" 2064-"E." It was cured for seventy-five minutes at forty-five pounds' steam pressure, and gave a stretch of 11½ inches, a tensile strength of 1810, and a set of 3/16. It was recorded on October 3, 1919, in my own handwriting, as soon as I got the physical test report from the physical testing laboratory.

"X" 2066, columns "O," "A," "B," "C," "D" and "E," is a record of compound experiments made with D. P. G. of various purities. Column "O" was cured with D. P. G. melting at 140 degrees Centigrade. Column "A" was cured with D. P. G. melting between 1:30 and 1:40 degrees Centigrade, and these were compared with D. P. G. of a higher melting point, such as between 145 and 147 Centigrade, which is the melting point recorded in the literature for a pure product. These tests were made in the summer of 1919.

By Mr. Edmonds:

140. Q. These tests on 2066?

A. Yes.

141. Q. These undated tests?

A. Yes.

142. Q. Made in the summer of 1919?

A. Oh, yes.

143. Q. On this page 2066?

A. Oh, yes.

144. Q. They follow tests on the preceding pages dated in September and Octboer?

A. Yes.

145. Q. And are immediately followed by other pages in October, November and December?

A. Well, I don't know what followed there.

By Mr. Wooster:

I object to Mr. Edmonds' questioning the witness now.

By Mr. Edmonds:

I apologize. It was so extraordinary that I couldn't let it pass.

By Mr. Wooster:

146. Q. Go on.

A. I evidently didn't have these tested in the physical testing laboratory, but I was contented with testing it by pulling the rubber slab, pulling it and feeling it, to see which ones were cured right; that is, whether the physical properties of one were much different than the physical properties of the other; that is, the ones with the pure compound.

"X" 2059, columns "D" and "E."—I made tests with D. P. G. that I prepared by an improved process, and I found that in some of the experiments that I made, the D. P. G. contained lead or litharge in it that got in there in the process of making it, and I determined the quality of this amount in the D. P. G. by burning a definite quantity and burning off the organic matter that would burn, and the litharge remained that wasn't burned as an ash, and I determined the percentage or quantity of this litharge and

D. P. G., and I compared this D. P. G. containing the litharge.

"X" 2059-"E" is a compound containing this D. P. G. which has 3½ per cent. of this litharge. Now, this was vulcanized, both "D" and "E" were vulcanized, for twenty minutes, at thirty pounds, and the stretch was 14¼ inches on both of them, and the tensile strength was 3400 pounds on both of them, with a set on "D" of ¾ of an inch, and that on "E" was ⅝. These were recorded in my own handwriting on the 12th of October, 1919, soon after I got the physical tests' report from the physical testing laboratory.

On the same page, columns "F" and "G," I tested D. P. G. of various purities, that is, "F" giving a melting point of 120 degrees Centigrade, and "G" giving an ash of 1.9 per cent, and a melting point of 140, showing that this D. P. G. was also made during the time I was working with this improved process and records were made in my own handwriting on November 9, 1919, soon after I got the report from the physical testing laboratory.

147. Q. How did the improved process that you have just referred to differ from the one described by you yesterday, with which you made your first D. P. G.?

A. Instead of using ammonia as one of the ingredients necessary, I used salt of ammonia, such as ammonium nitrate.

148. Q. When did you first obtain ammonium nitrate for this purpose?

A. There was some ammonium nitrate in the

laboratory, but I subsequently, in the summer of 1919, got a five-pound bottle of ammonium nitrate.

149. Q. What did you do with it?

A. I used some of it; the rest of it would remain.

150. Q. From October, 1919, on, what was your work at the Republic Rubber Company?

A. The same as it was before; outside of the routine work, any spare time I had was used in finding out this process for making D. P. G. and things like that.

151. Q. What was the condition of this company at that time, after October, 1919?

A. The condition was the same to me. After the first of the year 1920, in February of 1920, I learned that there was a financial crisis with the Republic, and that most of the men in the laboratory were to be allowed to go.

152. Q. What did you then do?

A. I finished up some of the work, and I left the Republic in March of 1920.

153. Q. What did you then do?

A. Just before I left the Republic, I made two trips to Akron and tried to interest some—in fact, all—of the large rubber manufacturers there in the use of D. P. G.

154. Q. Did you have any success?

A. No.

155. Q. What did you then do?

A. I then went to New York, it being my wife's home, and I lived in New York for some time, and while there I tried to interest some chemical manu-

facturers in the way of manufacturing D. P. G. and offer it to the rubber trade.

156. Q. What was the result?

A. No success there either until I visited the supply house that supplied the rubber manufacturers with various ingredients necessary for their manufacture. Now, I knew of this supply house, because we used to get some of the materials when I was at the Republic, from them, such as golden antimony. That was the States Metals Company, and the chemist of that company, Mr. H. S. Doty, visited the Republic Rubber Company while I was there, and I came to know him. So I went up to see him while I was in New York, and I talked with him about this accelerator that I had. I had a sample of it with me, and asked him to try it out for himself, and gave him a formula for trying it out, which he did.

157. Q. When was this?

A. This was early in April of 1920.

158. Q. At this time what were your financial means?

A. Not very good. I was married and just had a child then and I had to get into something to have enough means to live by, and I was anxious to do something, because I was pretty well in need of something to do.

159. Q. Did you tell Mr. Doty the name of the accelerator which you gave him?

A. No.

160. Q. Did you afterwards tell him the name of it?

A. Yes.

161. Q. What did you then do?

A. We made sort of a partnership agreement, whereby I would manufacture this D. P. G., and they were to finance it and offer it to the rubber trade, and sell it as an accelerator vulcanizer.

162. Q. Did they do that?

A. Yes.

163. Q. When did they commence?

A. In the summer of 1920.

164. Q. Did you have a plant?

A. Yes.

165. Q. What were you doing between the time you signed up and when you first put some out?

A. We looked around for a plant at the beginning, and finally located one in Brooklyn. There was some equipment there, and we put in additional equipment that was necessary, and I started then the first two batches, and by August, 1920, we had some finished product.

166. Q. What was this product called?

A. We gave that the trade name of "XLO."

167. Q. What was the composition of this material?

A. It consisted of two-thirds of D. P. G. and one-third of calcined magnesia.

168. Q. What was your position after that?

A. I was manufacturing this stuff.

169. Q. Where?

A. At the Brooklyn plant, at the beginning, and after that we got a plant manager. I was chief chemist and doing research work.

170. Q. When was the plaintiff incorporated, if you remember?

A. In February or March of 1921.

171. Q. Did it succeed the partnership?

A. Yes.

172. Q. When was the fire, to which you previously referred?

A. In September, 1921.

173. Q Where was the plant that burned?

A. In Brooklyn; 980 East 35th Street.

174. Q. Can you state when regular commercial production of D. P. G. had commenced?

A. In August, 1920.

175. Q. Was it in production at the time of the fire?

A. Yes.

176. Q. What did you do then?

A. We looked around immediately for a plant and located one in Newark, New Jersey.

177. Q. Did you get it?

A. Yes.

178. Q. When did you start it?

A. We started and began commercial production in December, 1921, December and from then on, in 1921, a couple of months right after the fire. It took us that long to rig up the plant and get things in shape.

179. Q. Did plaintiff, on the commencement of its manufacture, always sell this "XLO"?

A. No.

180. Q. What did it sell?

A. Diphenylguanidine afterwards.

181. Q. Pure or impure D. P. G.?

A. Commercially pure.

182. Q. What purity is that?

A. 98 to 99 per cent.

183. Q. You stated yesterday that you had other duties at the Republic during 1919, besides investigating accelerators. Did you make reports of such work?

A. Yes.

184. Q. Can you identify the reports if shown you?

A. Yes.

185. Q. Will you please look at the papers I show you and state what they are?

A. This is a report of comparative tests of different grades of thiocarbanilid, dated March 22, 1919, and signed "M. L. Morris, Chemist." This is a report of a comparison of flakso, in which the aluminum flake was substituted with magnesia, dated February 24, 1919, signed M. L. Morris. This is a report of analysis of paraphenylenediamine, obtained from the National Aniline Chemical Company, and signed by me, dated June 28, 1919. This is a report of results obtained by incorporating hexa, which was an accelerator used there at that time, and No. 6 cement, a certain cement used at that time, dated May 9, 1919, and signed by me.

186. Q. Are these all of such reports that you made during the period of your employment, or only examples?

A. I made quite a number of reports. These are only part of the reports that I made, or examples of such reports.

By Mr. Wooster:

I offer in evidence these four sheets as Plaintiff's Exhibit No. 3, Samples of Weiss Reports, 1919.

By Mr. Edmonds:

Objected to as irrelevant.

By the Court:

The objection is sustained and an exception noted to plaintiff.

CROSS-EXAMINATION.

By Mr. Edmonds:

X187. Q. You heard the testimony of Mr. Whitby yesterday. Do you agree with him as to all of the statements that he made in his testimony?

By Mr. Kennedy:

That is objected to.

Objection sustained.

By Mr. Edmonds:

X188. Q. You heard Mr. Carlton's story of the details of your claim of conception of this idea of using D. P. G. Do you accept that as your story, or must we go through that again?

By Mr. Kennedy:

Objected to.

Objection sustained.

By Mr. Edmonds:

X189. Q. When you were with the Republic Rubber Company you had had no experience whatever in the chemistry of rubber?

A. No.

X190. Q. And you started work under Carlton?

A. I did.

X191. Q. You came to know that Carlton had been working with T. P. G.?

A. He told me that.

X192. Q. And he mentioned to you the guanidines as a class of substances that might be accelerators?

A. It was discussed in general.

X193. Q. Did you come to know also that basic substances were accelerators, or rather that it was a fairly well established rule that to be an accelerator a substance had to be a basic substance?

A. Yes; from my experience during this time.

X194. Q. You mean you learned that by experience and not by reading?

A. By reading and by experience.

X195. Q. You got that from the literature?

A. I knew that magnesia and lime and litharge could be used for the vulcanizing of rubber, and those are basic substances, inorganic bases.

X196. Q. An accelerator, of course, cuts down the time of vulcanizing. Did you come to know from your association with Carlton, or otherwise, that in cutting down the time of vulcanizing by the use of an accelerator, the strength and elasticity of rubber would be improved?

A. That depends on the accelerator.

X197. Q. You didn't learn from Carlton that that was a fairly general rule?

A. No.

X198. Q. Carlton didn't tell you that?

A. No; he didn't tell me in those words.

X199. Q. Did he tell you that in substance?

A. No. It wasn't entirely as to time; it was

also with reference to the temperature or pressure used.

X200. Q. If the accelerator reduced both, either or both the time or temperature, then the quality of the rubber would be improved?

A. Not necessarily; not always. That was from my judgment in the use of accelerators, that it didn't always happen.

X201. Q. But a fairly general rule was to use organic accelerators?

A. I didn't know of any rule except the discussions I had with Carlton, and I don't know how general that was.

X202. Q. Did you know that monophenylguanidine was more basic than D. P. G.?

A. No, sir.

X203. Q. You didn't see monophenylguanidine in Richter's book?

A. No, sir.

X204. Q. What happened was that you had occasion to refer to Richter's book at the point giving certain data with respect to T. P. G., and you saw there on that same page D. P. G.?

A. I referred to Richter's book at that time quite often, because I was assisting Mr. Carlton in the preparation of some of these compounds, and I familiarized myself with the chemistry of these compounds very thoroughly, quite in detail.

X205. Q. By way of answering the question, on that same page with this data about T. P. G., you found similar data with respect to D. P. G.?

A. Yes; I looked up in the book the nature of

aromatic substituted guanidines, and I saw D. P. G. there.

X206. Q. Going on to a time a little later in point of time, you stated in the National case that you were away on a vacation during the first half of June, 1918, and that then you found that you had recorded many experiments in the "X" book during that first half of June, 1918. Is it still your testimony that you were away from the Republic plant the first half of June, 1918?

By Mr. Wooster:

I object to the counsel stating what the witness testified in the other case. It is entirely too general.

By Mr. Edmonds:

X207. Q. Did you take your vacation in the first half of June, 1918?

A. To my best recollection, I had my vacation in June, 1918. I do not recall exactly whether it was the first week or the last week in June, but it was some time in June, 1918.

X208. Q. Was it one week?

A. No; it was two weeks.

X209. Q. And you don't know when it was in June?

A. I do not recall that exactly.

X210. Q. Don't you recall that you undertook to state very definitely when it was—in the National case?

A. I don't recall, but my best recollection now is that it was some time in June that I took my vacation and went to New York.

X211. Q. Do you recall whether you stated the exact date when you got back, in the other case?

A. I believe I did, and corrected myself there.

X212. Q. You stated, did you not, that you were away the first two weeks, and that you got back on the 16th, having missed the train on which you expected to get back on the 15th?

A. It is my best recollection now that my vacation took place in June; some time in June of 1918.

By the Court:

213. Q. Counsel didn't ask you that. He asked you whether you testified that or not, at the trial of this other case.

A. I believe I did.

By Mr. Edmonds:

X214. Q. And then it appeared on examination of this book before you that many experiments were recorded in your handwriting, and dated in the first half of June, 1918?

A. Yes.

X215. Q. Now, a little later, in 1918, you say that you made some D. P. G. and produced an amount of about five ounces?

A. Five grams.

X216. Q. And that was perfect, the perfect melting point, wasn't it?

A. Yes; according to my test.

X217. Q. The first time you got a perfect property?

A. Yes.

X218. Q. And you made that up into a rubber compound?

A. Yes.

X219. Q. And with that compound you produced three vulcanized slabs?

A. I did.

X220. Q. Can you, in view of those facts, account for the fact that you stated in the affidavit which was filed in the National Aniline suit that the amount of D. P. G. that you made at that time was not sufficiently large to permit you to make a test of any kind? Have you any explanation for that?

A. I don't recall this at all. I would like to see it and see how the expression of it is.

X221. Q. What is your testimony now as to what you did with those three slabs that you made?

A. I had them tested, those three slabs. I didn't do anything except testing it with my tongue, and cutting with scissors, and pulling it, and after I did that I showed them to Mr. Daniels.

X222. Q. When was that?

A. That was in December, 1918.

X223. Q. That is not in strict accord with the testimony you gave in the National case, is it?

A. I don't recall that.

X224. Q. You don't recall that you said at one time that you told no one at all?

By Mr. Kennedy:

The best evidence of what he said is the affidavit itself, it seems to me.

By the Court:

You can ask him this question. I suggest, however, if it is for the purposes of contradiction, you had better call his attention to the specific

time and place and person, or the specific affidavit.

By Mr. Edmonds:

X225. Q. I read from your testimony in the National case: "Q. 61. That was a rubber compound you used diphenylguanidine with? A. Yes. By the way, before you go on with that,"—this is referring to those three slabs you say you made in December, 1918. "Q. 67. By the way, before you go on with that, did you inform anybody about the plant as to these efforts you were making to get diphenylguanidine? A. No one at all. Q. No one knew it? A. No one knew what I was doing?"

A. This question refers to the plant, and the way I understood it then, I did not tell anyone in the plant. It does not refer to the laboratory, and that is the way I understood the question at that time.

X226. Q. When you said, "No one at all, no one knew what I was doing," you meant no one in the plant, but you did not mean no one in the laboratory?

A. Yes.

X227. Q. After those three slabs were made from that five grams, you proceeded to make some more D. P. G., and in that effort you produced about 25 grams?

A. I did.

X228. Q. When was that done?

A. That was done immediately after I got these over-vulcanized slabs of rubber in December of 1918, and carrying it over a few days into January of 1919.

X229. Q. It took you some little time to do that, part of December and part of January?

A. It didn't take me very long then, I being familiar as to the handling of ingredients and applying every effort to get it done, after I was interested in the results.

X230. Q. Let us see if we can fix the time somewhat more definitely. Do you recall any trip you made about that time?

A. I did.

X231. Q. Whereabouts?

A. That was in January of 1919.

X232. Q. A trip where?

A. To the Carnegie Institute Library at Pittsburgh.

X233. Q. About how long a time on that?

A. Three days.

X234. Q. Can you fix the time of the trip?

A. Not definitely, but it was in the first part of January, 1919.

X235. Q. The first week?

A. Either the first or second week; I do not recall exactly.

X236. Q. Was this 25 grams of D. P. G. made before or after that trip?

A. Before.

X237. Q. When did you make your next supply of D. P. G.?

A. I started in March or the end of February. I started again to make some D. P. G. according to the methods I obtained from the Pittsburgh Library.

X238. Q. That 25 grams was what you used in making these slabs that you refer to as having been

made in the latter part of January or early in February, including the two shoddy compounds. That is correct?

A. Yes. Four compounds I had.

X239. Q. You are quite sure that you made this 25 grams of D. P. G. before this Pittsburgh trip?

A. Yes.

X240. Q. Have you any way of accounting for the fact that you signed an affidavit in the National case, in which you state the contrary of that, that the 25 grams was made after your return from this Pittsburgh trip?

By Mr. Kennedy:

I object to the assumption that there is any such affidavit or that the witness has made any such statement.

By the Court:

Ask him if in any particular affidavit, at a particular time, for use in a particular case, he didn't say thus-and-so.

By Mr. Edmonds:

X241. Q. I hand you a certified copy of an affidavit which I believe you executed on June 12, 1922, which was used in connection with a motion for preliminary injunction in the suit brought on the patent here in suit by the National Aniline Chemical Company. Will you state whether or not you signed the original of it?

A. Yes.

X242. Q. That is a copy of your affidavit?

A. Yes.

X243. Q. In this affidavit, after referring to conceiving this idea of using D. P. G. in 1918, and so forth, you say, "In June, 1918, I took my vacation, and went to New York and visited the New York Public Library at 42nd Street and Fifth Avenue, to look up various questions relating to accelerators, such as their poisonous nature and other questions. This was at the request of Mr. Munroe H. Daniels prior to my leaving on my vacation. Having had diphenylguanidine previously in mind, I particularly noted references to the same when looking for publication relating to triphenylguanidine, para———, etc. As a result of this examination at the New York Public Library, I found very little literature on diphenylguanidine, but found sufficient data to enable me to prepare a small quantity of diphenylguanidine, which I did during the month of September, 1918. The quantity prepared at that time was not sufficient to permit a test in a rubber compound." That last statement you say now is untrue, don't you?

A. When was that prepared, in September?

X244. Q. September, 1918, and I refer to the statement that the quantity produced at that time was not sufficient to permit the test of a rubber compound. Is that the statement you say now is untrue? Do you say now that that statement is untrue? I ask you if that statement is considered by you to be in harmony with the testimony that you have given here yesterday and today?

A. No.

X245. Q. Which is right—this affidavit or your testimony of yesterday and today?

A. The testimony is right.

X246. Q. Of yesterday and today?

A. Yes.

X247. Q. That is right and the affidavit is wrong?

A. It is not entirely wrong—If you want me to explain it.

X248. Q. The affidavit that I refer to continues: "During my conversation with Mr. Daniels in the month of September, 1918, I mentioned to him my tests in triphenylguanidine, and advised him that I also desired to try diphenylguanidine to ascertain whether it would be a good accelerator, and told him that I was at that time trying to produce a sufficient quantity to test it in a rubber compound in the laboratory. At that time I did not have sufficient data to produce any considerable quantity of diphenylguanidine. Then in January, 1919, I visited the library of Carnegie Institute, at Pittsburgh, Pennsylvania, and went through the literature on this subject. As a result of this investigation, I found descriptions of various processes for making diphenylguanidine by laboratory methods, and upon my return to Youngstown, Ohio, about the middle of the same month, January, 1919, I prepared sufficient diphenylguanidine and tested it soon thereafter in a rubber compound." Do you find that to be consistent with the testimony you gave here yesterday and today?

A. Yes.

X249. Q. Including the statement here that this D. P. G. was made after your return from this trip

to Pittsburgh, where you investigated the literature of D. P. G.?

A. You mean the description—

X250. Q. The affidavit states you made this second batch after your return from the trip here to study the literature?

A. It doesn't state that to me.

X251. Q. Let us read it again: "As a result of this investigation, I found descriptions of various processes for making diphenylguanidine by laboratory methods, and upon my return to Youngstown, Ohio, about the middle of the same month, January, 1919, I prepared sufficient diphenylguanidine and tested it soon thereafter in a rubber compound." Isn't that inconsistent with what you stated a few minutes ago?

A. It says rubber compounds, but it doesn't say these tests I made was with a diphenylguanidine produced before or after I went to Pittsburgh. I made all the tests later on, and this may refer to the other tests.

X252. Q. Your explanation isn't entirely clear to me. This affidavit, as I understand it, states that you made some diphenylguanidine in 1918, but it was insufficient for a test, and then you came down here to Pittsburgh and read the literature here, and that enabled you to go back to Youngstown and make another batch of this D. P. G., and that, I understand, is inconsistent with the testimony that you gave here this morning.

A. No, I don't read the affidavit that way. It is

in general terms there. It doesn't give specific data or details.

X253. Q. It says "Upon my return to Youngstown, I prepared sufficient diphenylguanidine and tested it soon thereafter in a rubber compound."

A. That is correct. That says in the previous part of that affidavit that I did not prepare a considerable quantity, see? It refers to a considerable quantity, and for that reason I went to Pittsburgh to familiarize myself more in detail with the methods of preparation, and when I returned I started, and thereafter at my leisure, whenever I had time to do it, I started experiments in making more diphenylguanidine, which I did, and tested it thereafter.

X254. Q. Try to be more specific about these things, instead of dismissing them in general terms. You said this morning that you made this second batch of 25 grams before going to Pittsburgh to consult the literature in the Carnegie Library?

A. That's right.

X255. Q. You still stick to that?

A. Oh, yes.

X256. Q. And if the affidavit is inconsistent with that, the affidavit is wrong?

A. If it is inconsistent, but I don't see the inconsistency.

By Mr. Edmonds:

I will now offer the affidavit in evidence, this being a certified copy of the original on file in the New York Court, and acknowledged by the witness to be a copy of his affidavit.

By Mr. Kennedy:

Objected to.

By the Court:

If it is objected to at the present time, in view of the fact that we are now hearing the plaintiff's case, I sustain the objection, with permission to counsel, of course, to offer it when his time comes for the introduction of it.

By Mr. Edmonds:

If that is the only objection, I will have it marked for identification and offer it later.

By the Court:

The affidavit can be introduced for the purpose of showing a contradiction of testimony of those parts. We will not rule upon that now.

RECESS.

AFTERNOON SESSION.

Thursday, October 8, 1925.

MORRIS L. WEISS resumes the stand.

CROSS-EXAMINATION (Continued)

By Mr. Edmonds:

X257. Q. You said something this morning to the effect that one of the compounds that you referred to in the X-book, with D. P. G. in it, was actually used in the Republic plant. You didn't mean by

that that it was used in the manufacture of articles for sale, did you?

A. The type of compound was used, but not the one that I have recorded there.

X258. Q. And no one with D. P. G. was used in that winter of 1919-1920?

A. No, sir.

X259. Q. And what you meant by putting the D. P. G. compound into the compounding room was something other than commercial manufacture?

A. Oh, yes, it was an experimental test.

X260. Q. Prior to that you had made your experiments in the laboratory and then you put this compound into the compounding room for further experimental work there?

A. No, sir.

X261. Q. Well, will you state what the fact was?

A. I selected this type of compound and compounded that in the laboratory to see just what effect D. P. G. will have on that compound. It was not used at that time.

By the Court:

X262. Q. You mean the compound with some other accelerator was being used, and you simply took the formula?

A. That is right.

By Mr. Edmonds:

X263. Q. Now you said something about putting the formula that had the D. P. G. in it into the compounding room. What was that done for? What did you mean to convey by that?

A. I don't recall making such a statement.

X264. Q. Well, you started to apply the name "Diffendoe" to D. P. G. What was the occasion for that?

A. The occasion for that was that after I experimented with diphenylguanidine, and found that it was of value, I ascribed to it a code name, so that eventually, if this accelerator would get into the compound room it would be used under that code.

X265. Q. Well, it was used in the compounding room, and there the name of "Diffendoe" was used instead of C. P. G., isn't that correct?

A. No. I compounded that myself. I used the experimental room to do it in, but D. P. G. wasn't actually used in the compound room for any other purpose or for any other compounds.

X266. Q. But the formula was known in the compounding room, wasn't it?

A. The formula was known in the compounding room, but with a different accelerator.

X267. Q. With "Diffendoe" used instead of "D. P. G.?"

A. Yes, but that formula was used with another accelerator, and I simply got this type of accelerator.

X268. Q. When was it you started to use the name "Diffendoe?"

A. That was later in the summer—or in the summer of 1919.

X269. Q. Now, you say you told Mr. Daniels something about D. P. G. He was the first person that you told anything about it to, wasn't he—that is, the first after Mr. Carlton?

A. Yes.

X270. Q. And who was the next after him?

A. Mr. Nellen was the one that I spoke to about diphenylguanidine in the laboratory.

X271. Q. Next after telling Mr. Daniels about it?

A. Mr. Nellen was the next after telling Mr. Daniels in the laboratory.

X272. Q. He was the next person in all the world—not in the laboratory—he was the next person that you told about D. P. G.?

A. No.

X273. Q. Well, who was?

A. Dr. Harvey Seil, chief chemist of the Youngstown Chemical Company.

X274. Q. When did you tell him about it?

A. I told him about it in the early summer of 1919.

X275. Q. And who was next after him?

A. Dr. I. Greenwald, who was my chief in the Harriman Research Laboratory, and he was a lieutenant in the U. S. A. Sanitary Corps in the summer of 1919; and I wrote a letter to him—I understood that he was working with some guanidines in his experimental work.

X276. Q. When did you tell him?

A. That was in the summer of 1919. I wrote him a letter stating that I prepared some pure diphenylguanidine and triphenylguanidine, and asked him in that letter if he would like to have some in his experimental work, that I would send him some.

X277. Q. And who was the next one after him?

A. About the same time I spoke to Mr. Nellen with reference to diphenylguanidine and asked him to give me some type compounds so that I could test that D. P. G. out.

X278. Q. Then when you told Daniels about it in 1918, you never spoke to anyone else about it until along in the summer of 1919, when you spoke to this man Seil?

A. That is correct.

X279. Q. You kept it to yourself all that time?

A. That is correct.

X280. Q. Could you fix any more accurately than you have when it was that you applied the name of Diffendoe to D. P. G.?

A. It was at the time that I got the type recipe from Mr. Nellen.

X281. Q. And that was the occasion for applying this new name to it, wasn't it—because that recipe that you had got you used under conditions such that other people would know about it?

A. Why, it would eventually be used under conditions that other people may know about.

X282. Q. So you wanted to use a name which would not indicate exactly what this chemical was?

A. That is right.

X283. Q. And that was how you came to use the name Diffendoe, and you applied it to this D. P. G. in this formula that you got from Mr. Nellen?

A. That is right. I used the code names for others. Triphenylguanidine I called "trifan," under similar conditions.

X284. Q. You recall, do you not, that in the National case you stated that you never told anybody about this diphenylguanidine except Mr. Daniels until you applied the name of Diffendoe to the D. P. G. and put the compound with Diffendoe in it into the compounding room?

A. I believe that was in answer to a question whether I told anybody in the plant, or anyone like that.

X285. Q. Well, let us see if it was. One of the questions put to you in the National case was this: "You said yesterday that no one knew what you were doing, and then immediately after you said that after you had gotten results from it,—'That is, when I incorporated the D. P. G. into the rubber, no one was informed until after I had actually gotten the rubber slab and found how it worked, then I informed Mr. Daniels.'" And you said, "Yes, I said that. I meant no one else with the exception of Mr. Daniels. Yes, I kept that work to myself not alone in 1918, but a good part of it in 1919. I had to use D. P. G. in the compounding laboratories, when I gave it a code name. Up to that time, no one was informed of my work with D. P. G. with the exception of Mr. Daniels." You recall that, don't you?

A. That referred to the plant or compounding room.

X286. Q. Oh,—there was an exception there that does not appear in your answer. Is that right?

A. I didn't understand that.

X287. Q. You mean to make an exception which is not stated in that answer?

A. Which answer?

X288. Q. The answer I just read to you. Well, never mind that. State where Mr. Daniels was. Was he in the laboratory or in the plant?

A. Why, he was in the laboratory and around the plant. He was the chief chemist. He was my superior.

X289. Q. So when you say that no one was informed of your work, you mean to say no one in the plant. You do not mean by that to exclude everyone, including those in the laboratory. Is that correct?

A. That is correct in so far as it goes to my 1918 and early 1919 experiments.

X290. Q. Now, will you state why you did not record these experiments that you say were made in 1918 in this "X" book?

A. Because I did not consider them complete experiments.

X291. Q. The X-book was kept there as a book in which to record experiments made by the chemists, made in the laboratory; was it not?

A. Those at his discretion were to be put in, that he wanted to put in.

X292. Q. Oh; it was entirely up to you whether to put anything in there or not?

A. Oh, yes.

X293. Q. But many experiments were recorded that were over-cured, were there not?

A. Yes.

X294. Q. And they would serve to show anyone coming along later that that compounding cure would over-cure, so that he wouldn't make that same mistake?

A. I don't know how much it would show to one coming along later, but there was a reason for putting in over-cure in that experiment at that time.

X295. Q. But even so, you didn't record these three experiments in 1918?

A. No; I didn't record it, for the reason that I did not consider them complete, and I expected to complete them and record them then.

X296. Q. As I recall, you said in the National case that it was your duty to record all experiments?

A. It was at my discretion entirely.

X297. Q. You recall, do you not, that in the aniline case some of the other ex-employees of the Republic Company said it was the rule that all experiments should be recorded in the X-book?

A. I recall they said that, but it was not my understanding at the time I took charge of the laboratory. In fact, I don't know of any rules existing at all; I don't know of any rules. I wasn't given any rules.

X298. Q. This test in the X-book, to which you have referred, in column E, on page 2034, you of course agree that the date there has been changed?

A. It looks that way.

X299. Q. Did you make the change?

A. I most probably did; yes.

X300. Q. Now, during this time, that is, through 1919, more particularly the early part, there was considerable work going on at the Republic plant with T. P. G., was there not?

A. In the early part, you say?

X301. Q. Through 1919, the first six or eight months of 1919?

A. In the early part there wasn't much work done in T. P. G. at the plant.

X302. Q. Wasn't there an effort made to develop a commercial process for the manufacture of T. P. G.?

A. That is true; yes.

X303. Q. And a semi-commercial plant was built for that purpose?

A. It was started.

X304. Q. You worked directly on that, didn't you?

A. I didn't work on the plant.

X305. Q. No; on the development of the process and the starting of commercial manufacture?

A. No. I developed that in the laboratory, and after doing that I consulted with the man who was to put up that semi-commercial plant.

X306. Q. Well, wouldn't you say that you worked on that more than anything else during the first eight months of 1919?

A. Oh, no.

X307. Q. The idea was to develop that commercial plant to the point of manufacturing the T. P. G. used in the Republic plant?

A. That was the idea.

X308. Q. The plant was to use that accelerator more than any other?

A. I wouldn't say more than any other.

X309. Q. But the plant didn't work very well, did it?

A. What?

X310. Q. The plant didn't work very well?

A. It didn't turn out very well, because my orig-

inal method that this plant was to follow was not thoroughly followed.

X311. Q. What accelerator was the Republic using during that time in commercial work?

A. During what time?

X312. Q. In the first eight months of 1918.

A. Why, they were using several.

X313. Q. More thio. than anything else?

A. I can't say exactly that. They were using several.

X314. Q. Now, you recall, do you not, that Mr. Daniels went to the Philadelphia meeting of the American Chemical Society, and that on his return he talked to you about accelerators?

A. I do.

X315. Q. And at that meeting he had made notes of things said or written by Dr. Kratz, and he had that note with him?

By Mr. Kennedy:

I object to that, on the ground it is outside the cross-examination, and another obvious attempt to introduce into the plaintiff's *prima facie case* matters of defense. So far as this Kratz lecture and the visit to Philadelphia are concerned, they are absolutely outside of anything said or suggested on direct examination—no reference made to any such visit.

By the Court:

Not specifically, but here is a certain subject matter which goes to show an independent investigation, and he has told what his labors were. Now, if there is anything which tends to test his

credibility in that matter, it is a proper subject of cross-examination, I take it. I will overrule that objection and note you an exception.

By Mr. Kennedy:

I assume, then, that the examination is permitted for the purpose of attacking the credibility of the witness, and not for any other purpose?

By the Court:

Well, it is admissible for that purpose. Of course it will be determined as to whether it is admissible for any other purpose when we come to it, but it is admissible for that purpose at the present time. If you want an exception I will note it.

By Mr. Kennedy:

Oh, yes, we desire an exception.

X316. Q. Now, will you answer the question?

(Question read.)

A. Yes.

X317. Q. That information that Mr. Daniels conveyed to you included the numerical representation given by Dr. Kratz to indicate the relative accelerating values of certain substances, including D. P. G., and anilin?

By Mr. Kennedy:

The same objection, your Honor.

By the Court:

Very well. Exception noted.

A. Yes.

X318. Q. And that was immediately after Mr. Daniels's return from Philadelphia?

A. Yes.

X319. Q. Do you recall that the question of continuing you in the employment of the Republic Company arose considerably before March of 1920? Did you know about that?

A. I have no idea.

X320. Q. Never heard of that until along in February or March of 1920?

A. That was the first time I heard of it.

X321. Q. Now, when you left the Republic, or just before you left, you applied for positions at various places, as you said this morning, and among others you applied at the Firestone Rubber Company in Akron?

A. Yes.

X322. Q. And they caused you to make out their usual formal application blank?

A. Yes.

X323. Q. And you made out that blank and left it there in the regular course of applying for a job?

A. Yes.

X324. Q. At that time you were very much in need of a job?

A. Yes. I was in need of employment; I had to support my family.

X325. Q. Your funds were very low and you had a family to support?

A. Sure.

X326. Q. This paper that I hand you is the original application that you made out, isn't it?

By Mr. Kennedy:

I reserve objections to that, your Honor.

By the Court:

Well, this is merely preliminary.

A. Yes; that is in my handwriting.

X327. Q. Where did you get the information stated on here, reading as follows: After referring to D. P. G., you say: "The laboratory tests show that one part of this product is equivalent to four parts of thiocarbanilid and one and one-half parts of hexamethylenetetramine." Where did you get that information?

A. I got that from practical experience with D. P. G.

X323. Q. There are tests in the X-book that would convey that information?

A. Yes.

X329. Q. What did you expect that statement to indicate to Mr. Shepard and to Mr. Young, who you say saw this application—particularly Mr. Shepard, with whom you talked? What did you intend him to derive from this statement, for instance, that one part of D. P. G. is equivalent to four parts of thio.?

A. To show how much more active D. P. G. is, compared with thiocarbanilid.

X330. Q. And that mere statement there would suffice to show him that you considered D. P. G. more active?

A. More active.

X331. Q. More active than thio.?

A. Yes.

X332. Q. He would understand further that in your opinion he could use one-fourth part of D. P. G. instead of one of thio., or if he used the same amounts of D. P. G. and thio., he would get a quicker cure, or cure with a less temperature. Is that correct?

A. I must hear that question.

(Question read.)

A. Well, that is not entirely correct, or properly stated.

X333. Q. Well, then, please state what you wanted him to understand by that statement of yours?

A. Well, what I wanted him to understand was this: that in a compound, assuming that he used four parts of thio., he would get an optimum cure; if he used one part of D. P. G., he would get an optimum cure. That is about all.

X334. Q. Suppose he used the same amount of thio. and D. P. G.?

A. Why, then he would get entirely different results.

X335. Q. Of course he would get an over-cure at the same time, with the temperature, but he could cut down the time or the temperature, or both. That is true, isn't it?

A. Why, he would have to do experimentation, in order to adjust his compound to the particular accelerator.

X336. Q. Very true. Did you tell Mr. Shepard, with whom you talked at the time you made this application—did you tell him that you were the individual who had originated the idea of using D. P. G. as an accelerator?

A. No, sir; not in those words.

X337. Q. Did you tell him that in substance?

A. Not in those words.

X338. Q. Well, did you convey that in substance?

A. I conveyed the idea that I experimented with D. P. G. and tested it out, and embodied my idea in the application there, in a way.

X339. Q. But you haven't answered my question. I asked you if you told him that you were the one who had originated this idea, the first one to conceive the idea of using D. P. G. as an accelerator?

A. I did not tell him that in those words; no.

X340. Q. Did you tell him that in substance?

A. I thought I did; yes.

X341. Q. It isn't on that application anywhere, is it?

A. There is some idea in that.

X342. Q. Will you look there and point out any suggestion that you considered yourself to be the originator of the idea of using D. P. G. as an accelerator?

A. Well, here it is. I say, "The laboratory tests show the relative—show that one part of this product" meaning D. P. G.; and when I said, "the laboratory tests show," I meant my tests, my laboratory tests—"that one part of this product is equivalent to four parts of thiocarbanilid and one and one-half parts of hexamethylenetetramine." And then I proceeded to give the physical characteristics of this product, and also show the course of it, showing my great familiarity with this substance.

X343. Q. We are not talking about your familiarity with the substance, at that particular time.

We will concede, for the purpose of this question, that you were entirely familiar; but what I am asking you at the present time is, did you claim at that time, in the course of your talk with Mr. Shepard, that you were the individual who first suggested using D. P. G. as an accelerator? Did you do that at all, and if so, did you do it orally or show it on paper?

A. In talking to him orally, I think I conveyed part of that idea, but I am not positive as to that. I spoke a great deal about my work with D. P. G., and I understood that to be that I was the one who did all that work in the past.

X344. Q. Then you did not put it on this application, but you meant to convey to him orally that you considered yourself to be the originator of the idea. Is that the fact?

A. I didn't put it in the application in these words—in those parts that I read, I understood that they would convey to him the idea that I worked with D. P. G., and that I was the originator of it.

X345. Q. You remember we had this same matter up in the course of the National suit, don't you?

A. I don't recall all that was up there.

X346. Q. Then I will read you this question from your examination in the aniline case. We were referring to Mr. Shepard, and I asked you, in XQ. 521: "Did you tell him that you were the man who first conceived the idea of using diphenylguanidine as an accelerator?" And you said, "I did not."

A. I didn't tell him in those very words; no.

X347. Q. Do you remember Mr. Stephens, at the Republic Company?

A. Yes.

X348. Q. Did you ever tell him that you were the originator of the idea of using D. P. G.?

A. I never spoke to him about D. P. G. that I know.

X349. Q. Did you ever tell Mr. Clark that you had originated the idea?

A. I never spoke to Mr. Clark about D. P. G. that I recall.

X350. Q. But notwithstanding the statement here in the aniline record, you think you conveyed—you intended to convey to Mr. Shepard that you considered yourself to be the originator of the idea?

A. Yes.

X351. Q. Now, you then went to New York and you applied for a position with the National Aniline Company, and there again, in the course of that application, you mentioned Dr. Kratz as one who had worked on D. P. G. That is true, isn't it?

A. Yes.

X352. Q. Did you claim in the course of your application for a position there, that you were the originator of the idea of using D. P. G. as an accelerator?

A. I don't think I did.

X353. Q. I hand you the paper that was used as an exhibit in the National case, this being an exact reproduction of the original application for employment with the National Company, made out by you. You recognize that, do you not, as a copy of the application you made?

A. Yes; this appears to be a copy of it.

By Mr. Edmonds:

I ask that the paper just referred to be marked for identification Defendant's Exhibit "B." And I also ask that the Firestone application, to which the witness referred, be marked for identification as Defendant's Exhibit "C."

X354. Q. Then you went to Messrs. Doty and Woodward and applied for employment there, and you took with you a small amount of this powder, that you left with them, when they showed some interest, for such use as they might want to make of it, understanding that they were going to make a test of it?

A. I didn't apply for employment there.

X355. Q. Well, what was it that took you there?

A. I wanted to interest them in the manufacture of this material and have them introduce it into the rubber trade.

X356. Q. You knew of them as selling antimony, the thing that you had worked with, and you were there at that time because of that, and this talk of rubber accelerators came up in the course of the talk that started with antimony?

A. I mentioned antimony, too.

X357. Q. Then in the course of time you found they were interested in rubber accelerators, and you left with them this sample of D. P. G. that you had with you?

A. I knew they were interested in rubber accelerators, because we got a sample of their rubber accelerators at one time, which test I made and recorded in the X-book.

X358. Q. And you left a sample of D. P. G. with them?

A. Oh, yes.

X359. Q. And you understood they were going to make a test of it?

A. I gave them the formula to make a test.

X360. Q. And you did not tell them what the substance was?

A. I did not. I told them it was a new accelerator that I had.

X361. Q. And then a few days later you came back and had a further discussion with them, and that led to the signing of a contract?

A. That is right.

X362. Q. At that first talk, before you told them what the accelerator was, that is, what its chemical name or formula was, what did you tell them about it?

A. I told them that I had a new accelerator that was very active, and that it was one and one-half times as active as hexa. and four times as active as thio., and produces very good results with rubber, gives a high tensile, cuts down the steam pressure or temperature with which a compound is cured, and also the time; and I offered a sample, that they should test it out, in comparison with any of those mentioned, and find out for themselves what it is.

X363. Q. When you told them it was so many times as active as hexa. and thio., what did you expect them to understand by that?

A. Why, I expected them to understand that that is a superior accelerator.

X364. Q. In what respect?

A. In the respect that it produces good results at a lower temperature and shorter time, and it re-

quires less work than others to produce the same results, or similar results.

X365. Q. That is what one would naturally understand from seeing that it is four times as active as so-and-so?

A. With respect to certain characteristics only—by cutting down the time or temperature. It does not necessarily apply to all the qualities that rubber would possess, by the use of this accelerator.

X366. Q. Then at this second meeting, or some meeting, you told them what the substance was?

A. I did.

X367. Q. Was that before or after you had arrived at an agreement under which they were to co-operate with you in exploiting this accelerator?

A. I believe it was during that time the agreement was written up and at the time it was signed.

X367. Q. I didn't ask you that. I asked you when you told them what the accelerator was?

A. At that time.

X369. Q. At what time?

A. That the agreement was written up and signed.

X370. Q. Now, was it before the agreement was signed or afterwards?

A. During the time—that is, the same day, or the same session we had.

X371. Q. Well, the purpose, I take it, of not telling them at the first meeting was that you did not propose to tell them until you knew whether you were going to reach an agreement to exploit it?

A. That is correct.

X372. Q. Now, did you reach an agreement and

sign up a contract before you told them, or did you decide to tell them before any agreement was actually signed?

A. At the time the agreement was reached, I told them what it was.

X373. Q. Before it was signed or after it was signed?

A. After it was signed.

X374. Q. Now, that is just what you said in the National case, isn't it? For instance, in XQ. 541, I said: "And did you tell them what this accelerator was before that was signed or afterwards?" And you said, "After that was signed."

A. I believe that was the case, as I recollect it. I don't remember it exactly. I took Messrs. Doty and Woodward for gentlemen at the time we reached the agreement, and understood it was perfectly well to tell them that, and if I recollect it correctly, I told them that after we signed—just after we signed the agreement.

X375. Q. You had a purpose in not telling them what the accelerator was at first?

A. Until we reached the agreement; yes.

X376. Q. Yes. And that purpose led you to withhold telling them what the accelerator was until after the agreement was signed. Is that correct?

A. That is correct.

X377. Q. What?

A. The purpose was—Yes, until an agreement was reached. That was mainly the purpose; it wasn't a question just of signing it.

X378. Q. That is the question I am asking you, and you at once said you did not tell them what it was

until after the agreement was signed. Is that your testimony?

A. If I recall it correctly, that was the case. Whether I told them that just before it was signed or just after it was signed, I don't recall; but I do recall exactly that I told them that after an agreement was reached.

X379. Q. On reference to this book (handing volume to witness), you see, do you not, that you testified in the aniline case that the disclosure as to what this accelerator was did not take place until after the contract was signed?

A. Yes; that is the testimony that I gave then.

X380. Q. Now, after you gave them this sample of D. P. G., without telling them what it was, several days elapsed—a few days elapsed—before you returned, and they told you that they had tested the accelerator and were interested in it? That is true?

A. Yes.

X381. Q. You certainly did not tell them what the accelerator was on that first occasion. You are very sure of that?

A. Oh, yes.

X382. Q. But that is not consistent, is it, with the statement that you made in one of the affidavits that you filed in the Patent Office when you were soliciting this patent? This was at the time you were endeavoring to carry your date of invention back of some reference cited as a basis for rejection. You say in this affidavit—page 650 of the record—you say in this affidavit: "On or about the 7th day of April, 1920, I called at the office of Mr. Henry F. Doty, and Mr. Van Lear Woodward, 30 Church Street, New York

City, and disclosed to them the said invention, and also delivered to them at said time and place a sample of diphenylguanidine." Can you explain that apparent inconsistency?

A. That is not the first time I called at their office. There is no mention in this affidavit that it was the first time or the second time.

X383. Q. No, there is not. Is that the only explanation you have to give?

A. That is the explanation.

X384. Q. Nothing more to say?

A. No.

X385. Q. You note that the affidavit says you made this disclosure at the same time that you called and left the sample?

A. I left a sample then. I had a sample with me when we reached an agreement. I gave them some more.

X386. Q. That is the best answer you can give?

A. That is the best answer I can give.

X387. Q. Now, this man Stephens that we referred to a while ago told you that accelerators were not patentable at one time, did he not?

A. He did.

X388. Q. But you found out early in 1920 that they were patentable?

A. Not early in 1920.

X389. Q. In the spring of 1920, when you went to New York and went to the Library there and took occasion to look up the subject?

A. It was toward the end of the spring; in the summer.

X390. Q. And you found there had been accelerator patents issued?

A. I found there had been accelerator patents issued; yes.

X391. Q. But no application for patent was filed by you until July, 1921, when you filed an application for a patent on a process for making D. P. G. That is correct?

A. That is correct.

X392. Q. And in August of 1921, I believe it was, you filed an application for patent on an accelerator which we call D. O. T. G.—that is right?

A. Yes.

X393. Q. You don't know why the application for the patent in suit was deferred until the following November?

A. No; it was out of my jurisdiction. My business associates had to do with that.

X394. Q. Now, I understand you to say that the tests recorded on this page X-2006, in the Two Thousand X-Book, although they were undated, were made at some time prior to the tests on the preceding page, all of which are dated, and some time prior to the tests on the page preceding that, most of which are dated, and prior to the tests on the page preceding that, all of which are dated, and so forth. That is correct?

A. That is correct.

X395. Q. In fact, you say that they were made prior to September, 1919?

A. Yes.

X396. Q. Of course, there is no connection in your mind between that and the Kratz paper?

A. No.

X397. Q. Now, at three other places in this book there are tests which include D. P. G., and which are dated prior to September, 1919, if we include within the three the one whose date has been changed. That is right, is it not?

A. Yes.

X398. Q. You recall, do you not, that during the trial of the National suit, you were asked to state what tests in this book, using D. P. G., were made prior to September, 1919?

A. I don't recall exactly just what I was asked.

X399. Q. You do recall, do you not, that never in the course of the trial of the National suit was there any suggestion that any of the tests recorded on page 2006 were made prior to September of 1919?

A. There was something said about it, if I remember right. I didn't see the record—

X400. Q. Then I will ask you to let me recall something to your mind from the National case. At one time during the trial of the National case—this is page 281, XQ. 430—while you were under cross-examination, and shortly before a noon recess, the following questions were put to you: "XQ. 428. Excepting this entry on page 2034, that we have just been referring to, and also the entry on page 2006, dated February 21, 1919, and also the entry on page 2042, of March 4, 1919, can you point to any entry in this book, showing the use of diphenylguanidine at any time prior to the 10th day of September, 1919?" And you said, "Used by us, you mean?" And I said, "Yes, or anyone else." You said, "I will have to start from the beginning." And then I said to you, "I will

ask you to do that during the noon recess, and if you can find any entry of that sort, I wish you would call my attention to it. My own opinion is that you will find none, but if you do not accept that statement, I want you to tell me." Now, do you recall that that occurred?

A. Yes; it is in the record here.

X401. Q. And you never made any statement to me from that time on that any other test recorded in this book was a test made prior to September, 1919?

A. As I recollect, I don't believe I did say anything like that.

X402. Q. Well, let us take it step by step. Did you ever, in response to that, state to me that any other test was made prior to September, 1919?

A. I didn't tell you anything after that, if I recall it right. I don't believe you asked me after that again.

X403. Q. I asked you right in that question. Did you ever respond to that in any way?

A. No; not to that question.

X404. Q. These two tests on shoddy compounds with D. P. G., to which you have referred, they indicate no superiority for the D. P. G. over T. P. G. in that compound, do they?

A. May I refer to that?

X405. Q. Oh, yes—One is on page 2006, column H—

A. I have got it.

X406. Q. And the other is on 2042, column A?

A. The tests on 2006-H show a distinct superiority over T. P. G., as shown in the X-book, because that comparison was made, and the comparison is recorded

on X-2005-G, in which experiment three parts of T. P. G. were used as compared with two parts of D. P. G., used in experiment X-2006-H. This experiment in X-2005-G shows that a compound was cured for twenty minutes at 35 pounds steam pressure, and had a stretch of 11 inches, and a tensile strength of 525 pounds, and a set of 19/32. Done at the same time as the experiment recorded in X 2006-H. It is in my handwriting, and is dated 2/21/19, exactly as the experiment recorded on 2006-H, which is dated 2/21/19. It shows a distinct advantage by having a tensile strength nearly 200 pounds greater than the compound in which three parts of T. P. G. was used; also, it was cured in a shorter time, and had a lower steam pressure or temperature.

X407. Q. The statement that you have just given is contrary, if I remember right, to the testimony you gave in the Aniline case, or in the National case. Don't you recall that you said at that time that the two experiments with shoddy compounds show no advantage of D. P. G. over T. P. G.?

A. I don't recall, but I do recall that was the first time I saw that X-book ever since I left the Republic Rubber Company, and under cross-examination at that time I didn't analyze the two compounds I prepared.

X408. Q. You were particularly interested in shoddies back there in January and February, 1919, weren't you?

A. Before that, too.

X409. Q. And when you made some D. P. G. your first thought was to try it in a shoddy compound?

A. I did that with all accelerators that I tested.

X410. Q. And that was the first thing you did with D. P. G. in 1919?

A. No. The first thing I did with any accelerator, as I did with D. P. G., was to test it out in a rubber accelerator testing vessel.

X411. Q. In the National case, I asked you about these experiments with shoddy, and you said, "That is reclaimed rubber, and I know that the accelerators in use at that time, hexamethylenetetramine and thiocarbanilid, were not satisfactory, and I tried previous to that, in 1918, when I worked on hydrolene and T. P. G. in a shoddy compound, and found it was satisfactory to a degree. My first thought then, after I prepared D. P. G. in a quantity that I could test out, was to see how it would work on a shoddy compound, and I prepared a shoddy compound and tested that out, and found from the results, though, that it was not to any degree much better than T. P. G. It was a little better than T. P. G." Do you wish to change that now?

A. I said it was better. It was largely a question of degree, and at the time I answered that, I didn't recall the exact figures I got with T. P. G. But these figures are here, and were here, and the tests were made, and I made the tests; only after a lapse of time, I didn't have the exact figures at my finger-tips, but I knew it was better.

X412. Q. So you still stand by this answer, "It was not to any degree much better than T. P. G."

A. I said also it was better.

X413. Q. "It was a little better than T. P. G."?

A. It was better to a larger degree—now, when I compare the figures.

X414. Q. So you want to change that now to mean it was much better?

A. It shows that distinctly.

X415. Q. Well, two people might disagree as to what those figures show, so I am asking you if you still stand by the answer you gave before, or if you want to make a different answer?

A. This is my opinion, that it stands out much better than the tests made with T. P. G. under those conditions at that time.

X416. Q. And this answer gives your opinion at the time of the National trial?

A. I said it was better, and it was only a question of degree, and I didn't specify that degree to any large extent. I said it was a little better than T. P. G.

X417. Q. Now, please look at page 2005 of this X-book. At the top of this page appears the words "On shoddies." Do you recognize that as having been written there by you?

A Yes.

X418. Q. Over here on the left-hand side is "D shoddy," and "Z shoddy," and "C shoddy." Were those three written there by you?

A. Yes.

X419. Q. Under that appears the name of some chemical, written in longhand. Is that yours?

A. Yes.

X420. Q. And under that seems to be "Triphenylguanidine." Is that yours?

A. Yes.

X421. Q. Under that is "Brown crepe," or a provision for it. Is that yours?

A. Yes.

X422. Q. Down below, "Barytes," and under that appears the name of some chemical written out in longhand. Are those two your writing?

A. Yes.

X423. Q. Now, look at the figures in the columns headed by the printed letters A, B, C, D, E, F, G, and H. Are the figures in those particular columns yours?

A. Yes.

X424. Q. Down at the bottom of column G, or below the bottom of that column, seems to be written "Was not cured well." Is that your writing?

A. No; it isn't "Was not cured well."—"Was not mixed well."

X425. Q. Excuse me. "Was not mixed well."—Is that your writing?

A. Yes.

X426. Q. And under the last column at the right is another written statement. Is that your writing, and if so, what is it?

A. It is my writing.

X427. Q. And what does it say?

A. "Not mixed well."

X428. Q. These columns from A to H, inclusive, have dates at the bottom of them which I understand you to say were written there by you, and from those dates you are able to say you made those tests on or about those dates and entered them in the X-book on or about those dates?

A. Yes.

X429. Q. This statement at the top of the page, "Action of organic Accel." That wasn't put there by you?

A. No.

X430. Q. And over here at the left appears "Diphenylguanidine," and that was not put there by you?

A. It was not there at the time I used that page.

X431 Q. That was not what I asked you. I asked you if you put it there?

A. No; I didn't put it there.

X432 Q. Now, these figures in the column that has no letter at the top, the column at the left of column A, those figures were not put there by you?

A. No; I didn't put those figures there.

By Mr. Edmonds:

May I have the answer that the witness volunteered stricken out, please? The witness volunteered that something was not there, which was not the question asked him at all. I asked him if he wrote that there. I don't mind it standing, except that I don't want it standing as testimony brought out by the defendant. So I ask that that volunteered answer be stricken out.

By the Court:

If there is no objection, that will be done.

X433. Q. Just to clear up the matter—I asked you if you wrote this matter in parenthesis at the top of the first column of figures, which seems to be "X 2004-C"; I don't know what it means, but I will ask you if you wrote it there?

A. No.

X434. Q. Now, I understand that you claim that you devised an accelerator called ditolylguanidine, and that you disclosed that to Mr. Daniels, and that you made some of that in 1920, I believe, and that you call a disubstituted guanidine. Is that correct?

By Mr. Wooster:

That question is strictly outside of the direct examination, if it is not to be an inquiry into dates of invention—

By Mr. Edmonds:

I have no interest in the dates. I thought they were public now.

X435. Q. Will you answer, please?

A. Yes.

X436. Q. You made no particular disubstituted guanidine between the time of making D. P. G. and ditolylguanidine?

A. I didn't actually any.

X437. Q. Now, what was the next disubstituted guanidine that you made after making ditolyl?

A. I made phenyltolylguanidine.

X438. Q. Is that a disubstituted guanidine?

A. Yes, sir.

X439. Q. When did you make that?

By Mr. Wooster:

Objected to, as outside the direct, and involving dates of specific inventions not involved here.

By the Court:

The particular purpose is in connection with these number of claims of the patent which they

assert cover all disubstituted guanidines, including his ditolyl, and I suppose they would say these ditolylphenyltolylguanidines—or whatever it is—and I wish to know how far this witness is qualified to say whether or not all disubstituted guanidines were accelerators. That is a very pertinent inquiry, because they are presenting and insisting on claims which they call class claims, claims covering a whole class of substances, instead of just one substance, diphenylguanidine.

By the Court:

Go ahead. We will allow you to ask the question.

By Mr. Wooster:

Will your Honor specifically rule whether he should give dates of when he made these later compounds?

By Mr. Edmonds:

I will amend the question. Perhaps you will not object to it in a different form.

X440. Q. Will you state whether or not you made this phenyltolylguanidine prior to November of 1921?

A. I did not make it prior to November of 1921.

X441. Q. Then prior to November, 1921, the disubstituted guanidines with which you were familiar —with which you had become familiar by actual test, were D. P. G. and ditolyl?

A. As specific matters of this class; yes.

X442. Q. Those are the only ones—that is what

I am asking you? Were those the only ones that you knew by test to be accelerators up to November, 1921?

A. By test; yes.

X443. Q. Those were the only ones. Now, will you state whether or not dianisylguanidine is an accelerator?

By Mr. Wooster:

We object to that as outside the direct examination, and as hypothetical.

By the Court:

It might in some way throw light upon the knowledge—or test the knowledge—of this particular witness, and throw light upon his testimony, in so far as it affects his claim of invention of this particular matter that is here in suit. We will allow it.

Exception noted to plaintiff.

A. Yes, it will be; to a degree.

X444. Q. That is a disubstituted guanidine, isn't it?

A. Yes, that is a disubstituted guanidine, only I would like to refer to a specific formula, as I understand it is made from anisal.

X445. Q. I now hand you a formula of dianisylguanidine. Now, will you answer the question?

A Yes, this is a disubstituted guanidine, and in my opinion it will be an accelerator to a degree.

X446. Q. Will you undertake to say whether or not any substance which is a disubstituted guanidine, and of which you know only the formula—whether or not that is an accelerator?

A. Yes, I can say to a degree.

X447. Q. Now, let us not qualify everything by saying "to a degree." Can you say whether or not a substance is an accelerator, if I give you the name of it?

A. No; I can't say that.

X448. Q. Can you say definitely whether or not this substance is an accelerator—and I understand you have not tried this—this dianislylguanidine, can you say definitely whether or not that is an accelerator?

A. From its structure—Of course I don't know if it exists as such; I am not familiar with this particular guanidine—but from its structure I would say it is an accelerator to a degree. I don't know whether it is existing in its free state, or in what condition it does exist, but just judging from this formula, and being familiar with this class of disubstituted guanidines, I would say it would be an accelerator to a degree.

X449. Q. Do you know how many disubstituted guanidines there are, or can you give us a fair estimate of that?

A. No, sir.

X450. Q. Would you say a dozen or a hundred, or a thousand, or what?

A. I can't give you any estimate. It would be purely a speculation.

X451. Q. You don't know whether a dozen or a thousand is nearer?

A. It would be a dozen—more than a dozen, maybe.

X452. Q. But you don't know whether a dozen

or a thousand—which of those two is nearer the right number?

A. Oh, a dozen is more the right number. It may be more than a dozen disubstituted guanidines would be accelerators—more than a dozen. I haven't counted them.

X453. Q. I show you the formula for another disubstituted guanidine. Would that be an accelerator of rubber—I show you the formula of dibenzoylguanidine?

By Mr. Wooster:

Objected to as hypothetical and outside the direct examination. A chemist can write down innumerable formulas of substituted guanidines, and cross-examining counsel can come in here and call them such and give a name to them, but that is not an issue in this case. The defendant is here, because it uses a specific disubstituted guanidine, which is called diphenylguanidine. I think the line of examination is a matter of defense, rather than to test the memory or the qualifications of this witness, in view of what he testified on direct examination.

By Mr. Edmonds:

The difficulty is not with the defendant. It is that the plaintiff is here asserting that this is a patent which covers all disubstituted guanidines.

By the Court:

You are relying upon your fifth claim, aren't you?

By Mr. Wooster:

Yes.

By Mr. Kennedy:

May I say a word? If they have anything in the prior art that is admissible here, then these things that they have reference to may, at least, for the purposes of argument, be relevant and material to the case, and possibly also on the cross-examination of this witness. But so far as we know, they are purely hypothetical things, with which the issues here are not concerned. The issues here are concerned, so far as the validity of the claims are concerned, with the defenses that they have set up, and what the defendant is using. The defendant is using not only a disubstituted guanidine, but a specific form of disubstituted guanidine, namely, diphenylguanidine. Now, as to whether or not these things are disubstituted guanidines is entirely irrelevant and immaterial, and certainly outside the direct examination of this witness, and therefore improper cross. Theoretically, if this is permissible, they can go through a whole list of their own, or books, or anything else, and ask these identical questions, and then prolong a case that they say they are desirous of accelerating.

By the Court:

We agree with what counsel has said, to some extent—that perhaps it does not tend to shed a very great deal of light on the case, but at the same time is something which may test the witness, in so far as his claims of invention are con-

cerned, and his claims as to his investigations. It might throw some possible light on it. Whether it is worth the time that is being taken up on that line, I seriously question, however.

(Question read at request of counsel for defendant.)

A. I don't know.

X454. Q. Is that a disubstituted guanidine?

A. From its structure it appears to be—from its structure.

X455. Q. How would you proceed to find out whether that is an accelerator?

A. By testing it.

X456. Q. As a matter of fact, that is the only way you could find out, isn't it—test it in a rubber slab?

A. We can in another way—by analogies.

X457. Q. You recognize the document I hand you, do you not, as a brief prepared in your behalf in an interference pending in the Patent Office?

A. That is what it states here. I don't remember what it complains of.

X458. Q. In this brief, on page 5, it states: "It is admitted in the testimony of all the parties to this record that one cannot foretell whether or not a given compound will be an accelerator of rubber." That is stated in this brief filed in your behalf in Washington. Is that a correct statement?

A. I didn't write that.

X459. Q. What?

A. I didn't write that.

X460. Q. But I am asking you whether that is

a correct statement. Do you dispute that statement, or is it correct?

A. I dispute that in a way.

X461. Q. In a way? That leaves us very much in doubt.

By Mr. Edmonds:

May I have this brief marked for identification, and I wish to offer this in evidence on behalf of the defendant at the proper time, if that may be done. I think it will shorten the examination quite considerably.

By the Court:

You may mark it at this time, and we will consider the admissibility of it when it is offered.

(The brief was thereupon marked for identification Defendant's Exhibit "D.")

By Mr. Edmonds:

We can shorten this examination somewhat by a concession, if counsel for the plaintiff wish to do so. I will make a statement of what we will concede, and see if that is agreeable to counsel for plaintiff.

The application for patent filed by Mr. Weiss —for ditolylguanidine, filed, as he stated, in August, 1921—has become involved in an interference proceeding in the Patent Office, and that the issue in that interference concerns both this accelerator ditolylguanidine and a broader claim of all orthotolyl guanidines as accelerators, and in that proceeding Weiss is contending that the broad claims on orthotolylguanidines are not

patentable claims at all, and that should be withdrawn, and the proceeding go on only as to the narrower claims of orthotolylguanidines, and this brief that I have just questioned Mr. Weiss about is the brief filed in his behalf in that interference, where this contention is advanced with respect to this broad claim, and where priority on behalf of Weiss is argued as to the less broad claim on ditolylguanidine. That is a statement of fact, isn't it, Mr. Wooster?

By Mr. Wooster:

I am not prepared to concede that now, but there is no objection by the plaintiff here, to the entire record and briefs in that interference being considered here, in so far as the points may speak for themselves. In other words, there will be no question by plaintiff here that those are the records, and Mr. Edmonds can argue anything he wants from them. I cannot, without going over a thousand pages of printed record and two hundred or more of printed briefs, make any stipulation such as he states here.

By Mr. Edmonds:

This is just a statement of the broadest features of the proceeding, and there could not be any mistake as to them. Of course, if you would like to see that written out, and then examine it more closely, we can hold that over until you have seen it in type.

By the Court:

That is a suggestion, which counsel for the other side, of course, are not called upon to agree, unless they desire to do so.

By Mr. Edmonds:

X462. Q. This ditolyl application of yours is owned by the plaintiff, the Dovan Chemical Company?

A. Yes.

RE-DIRECT EXAMINATION.

By Mr. Wooster:

463. Q. In your direct examination, did you say that you mentioned to Mr. Holliday that you were using diphenylguanidine as a rubber accelerator?

A. Diphenyl.

464. Q. Diphenylguanidine?

A. No; not diphenylguanidine; I called it diphenyl.

465. Q. Did you at any time tell Mr. Holliday what the full name was?

A. No.

466. Q. Relative to your disclosures of diphenylguanidine, to Mr. Carlton, Mr. Daniels and Mr. Nellen, where did your disclosure of diphenyl to Mr. Holliday come in?

A. Well, about that time that I got the optimum cure of diphenylguanidine, and that was about February of 1919, or the latter part of January, when I made those cures, I also made some tests with triphenyl guanidine, and Mr. Holliday noticed the shortness of the cures, and he asked me, saying, "You have something good here." I said, "Yes, that is diphenyl."

And that is all I meant to say to him. I didn't want to convey to him the whole idea of what it was at that time, but just so as to differentiate between the other, the other being made with triphenylguanidine, the cures of which were high.

467. Q. Was that before or after you had mentioned D. P. G. to Mr. Nellen?

A. That was before.

468. Q. Was it before or after you mentioned D. P. G. to Mr. Daniels?

A. That was after.

469. Q. Do you recall the names of any of the accelerators that were used in the first eight months of 1919, in the regular product of Republic Rubber Company?

A. Yes; hexamethylenetetramine and thiocarbanilid. Those were the ones that were used.

470. Q. Did they have code names?

A. Yes.

471. Q. What were they?

A. "Mexa" was for hexamethylenetetramine, and "Cromite" was the one for thio.

472. Q. Anything else?

A. There was another accelerator used to a small extent, and the code name for that was, "Flasco."

473. Q. What was its active ingredients?

A. Paranitrosodiemethylanilin.

474. Q. After you applied to National Aniline & Chemical Company for a position, to whom did you apply?

A. I applied in the office, and I was referred to a man by the name of—

475. Q. Wait a minute. To what company did you next apply? After you applied to National Aniline & Chemical Company, to what company did you next apply?

A. Roessler & Haslacher Chemical Company.

476. Q. Where?

A. At their office in New York City.

477. Q. Whom did you see?

A. The clerk advised me to write a letter to their Dr. Carveth, who was at the Perth Amboy plant.

478. Q. Did you do it?

A. Yes.

479. Q. Did you afterwards have an interview?

A. Yes.

480. Q. Where?

A. At the Perth Amboy plant.

481. Q. With whom?

A. Mr. Dill and several other people who were with him.

482. Q. Did they give you a position?

A. No.

483. Q. What did you say to them?

A. I told them that I had a good accelerator, and I know how to make it, and wanted to make it. and they asked me details about it, and that is as far as it went.

484. Q. You didn't tell them what it was?

A. No.

485. Q. Was it before or after you had seen Mr. Dill that you saw Messrs. Doty and Woodward?

A. It was after I saw Mr. Dill that I saw Messrs. Doty and Woodward for the first time, when I got an

answer to my application and made an appointment with Mr. Dill and went up to see him.

486. Q. Was it before you made the contract with Doty and Woodward?

A. Yes.

487. Q. I show you a contract purporting to be between yourself, Van Lear Woodward and H. S. Doty, dated April 13, 1920, and ask you to look at it and state what it is?

A. This is the agreement, the memorandum of agreement, that I entered with Messrs. Doty and Woodward. This is the agreement.

488. Q. Does this contract enable you to state whether or not you had disclosed diphenylguanidine to Messrs. Doty and Woodward before or after you signed this contract?

A. Why, before—that was on account it was written up before I actually signed it.

489. Q. Do you recognize the signatures on this contract, and if so, state whose they are?

A. Yes. There is my signature on it, and one of Van Lear Woodward and H. S. Doty, that I recognize.

By Mr. Wooster:

It is stipulated that a correct abstract of this contract is printed at pages 71, 72 and 73 of the Record for Weiss, in Patent Office Interferences 47394 and 49357, and that said abstract may be referred to in this case in lieu of the original here produced.—To avoid reference to the printed record, I will offer a typewritten copy of this abstract as Plaintiff's Exhibit 4.

490. Q. Did Mr. Daniels, upon his return from Philadelphia, tell you that Mr. Kratz had compared thio. and hexa. with D. P. G.?

A. No, sir.

By Mr. Edmonds:

I object to the question. You shouldn't lead the witness that way. Ask him what he told him, or something of that sort. The answer is all in the question.

By the Court:

Yes; it is perhaps leading. I don't recollect the testimony that was given, to which that is responsive, however. What was the testimony? Was that on cross-examination?

By Mr. Wooster:

It was cross-examination about what Mr. Daniels told Mr. Weiss as to what Mr. Kratz had said at Philadelphia. That was brought in over objection.

By the Court:

Well, the inquiry is in and answered, and I will not strike it out; but it is not in very desirable form of introduction.

By Mr. Wooster:

May I withdraw it and start again?

By the Court:

Well, now that it is in, I believe we had better leave it in. It will simply add to the time.

491. Q. You were referred to an apparent change in the date of test 2034-E, wherein the only figure appearing to be changed is the first figure "2"? Do you know anything about that change?

A. Why, I probably made that change from a "1" to a "2," as February was so close to January, I might have put down "1/10/20" and corrected myself, making a "2" out of the "1," which is apparent.

By Mr. Edmonds:

I ask that that answer be stricken out. I don't think that speculation from a witness should be permitted in this record.

By the Court:

I shall allow it to stand. Of course the weight of it will be for consideration by the Court.

492. Q. Referring now to X-book, page 2005, you said in cross-examination that the ink-printed words in the first column, "diphenyl guanidine" were not written by you. When did you first see those words on that page?

A. At the trial of the National and the Dovan, when I saw the X-book for the first time after I left the Republic.

493. Q. Could you say whose handwriting that is in?

A. No.

494. Q. When you first saw this page X-2005, in the X-book, what was written on it?

A. This caption here, "Action of organic accel." I remember this being written on (indicating), and these figures here (indicating), and this "X-2004"—

495. Q. Now, you say "these figures"—The Ink figures?

A. 2005, and in parentheses, "X-2004-C."

496. Q. What was the next writing put on this sheet?

A. The next writing I put down, "D shoddy," when I made these experiments—experiments recorded in 2005, column A and column B, and column C, down to column H.

497. Q. I note that parts of columns A, B, C, D, E, F, G, and H all add up to 100. In whose handwriting are these additions, "100"?

A. These are in my handwriting.

498. Q. In the column to the left of column A, the parts add up to "—101.00." Are those in your handwriting?

A. No, sir.

499. Q. At the time you last wrote on this page X-2005, what is your recollection as to whether or not the figures in the column to the left of column A, and the addition footing up to 101.00 were there?

A. It is my recollection that they were not there. I don't recall exactly whether they were there. It is my recollection that they were not there. There were no figures there.

500. Q. What is your recollection as to the ink-printed "diphenyl guanidine"?

A. It is my recollection that that was not there.

501. Q. What is your recollection as to the date at the bottom of column to the left of column A, "2/22/17"?

A. I don't recollect seeing that there.

502. Q. Taking the items in the column to the

left of column A as "Smoked sheets 50, sulphur 3, zinc 47," state whether or not you recognize those?

A. I don't recollect seeing those there.

503. Q. Do you recognize that as any formula?

A. Yes; it looks like a formula. It looks like a standard formula—like a standard comparison formula.

504. Q. With or without accelerator?

A. Without accelerator. It adds up to 100.

505. Q. If an accelerator is then added, do you add that on to 100 parts or not?

A. No. The accelerator is generally substituted either in the zinc or in the rubber.

506. Q. Can you point out some examples of that in the X-book?

A. Yes. This one, X-2010, column O. The accelerator was substituted in the zinc, and it adds all up to 100.

By Mr. Edmonds:

507. Q. There are various of them that add up to 101, aren't there?

A. This is an exact formula there (indicating sheet marked 2010).

508. Q. X-2035, the first column adds up to 102, also X-2028? What was your answer?

A. I answered that this 2010, column O, in which the accelerator was substituted in the zinc, instead of just being added to the standard formula, and it adds up to 100 in this formula.

By Mr. Wooster:

509. Q. I understood you to say on cross-examination that you disagreed in a way with the statement quoted from page 5 of the brief on your behalf in the D. O. T. G. interferences, to the effect that "One cannot foretell whether or not a given compound will be an accelerator of rubber." Will you explain what you meant by "in a way"?

A. Well, if that compound would be a disubstituted guanidine, derived from primary analytical (?) means, I could foretell in a way that it would be an accelerator.

510. Q. In the two formulas shown you in cross-examination, did you the carbonide group substituted in the two formulas?

A. Yes.

511. Q. Is that the same kind or a different kind of substitution as shown by you in your patent in suit of diphenylguanidine?

A. It is a different kind of substitution.

512. Q. Would or would not such different kind of substitution change the function and operation of the resulting compound, if a compound such as given by these two formulas was obtained?

A. Sure.

513. Q. As compared with a disubstituted guanidine of the type of D. P. G.?

A. It would; yes.

RE-CROSS EXAMINATION.

By Mr. Edmonds:

X514. Q. Will you turn to page X-2005 of the X-book? What was in the space directly above "D shoddy"—What was in the space there at the left, directly above where you have written "D shoddy"? You say you don't remember "diphenyl guanidine" being there. Do you remember what was there?

A. Well, just what part of the page are you referring to?

X515. Q. In the column on the left?

A. In the column on the left.

X516. Q. Yes. You don't remember what was there?

A. No. That wasn't there.

X517. Q. I am asking you what was there?

A. There wasn't anything there, as I recollect.

X518. Q. You can't recollect what was there?

A. There wasn't anything there.

X519. Q. Now, I want to get at that very definitely. I want you to say if you don't recollect what was there, or that you know that nothing was there. Which is it?

A. I recollect there was nothing there.

X520. Q. That is your recollection?

A. That is my recollection.

X521. Q. What do you recollect was in that first column?

A. I don't recollect exactly what was in there. It might have been blank, too. I don't recollect that.

X522. Q. You don't recollect anything about it?

A. No.

By Mr. Wooster:

What time are you talking about?

X523. Q. I am asking you now about your recollection about what was there when you were using this book, at the time you were in the employ of the Republic Company—there was some six years ago, five and a half or six years ago. You undertook to say that you do not recollect that "Diphenyl guanidine" was printed in that first column, I understand?

A. No. I recollect that there wasn't anything there in that left-hand column above "D shoddy"; at the time I wrote it, there wasn't anything there. It was "diphenylguanidine"; it was written that way—

X524. Q. It was written there—what?

A. There was nothing there.

By the Court:

525. Q. You mean by that, then, that this "D shoddy" and "C shoddy," and so forth, was not written there, either?

A. Oh, yes; this was written. I wrote this. I meant this legend here (indicating).

By Mr. Edmonds:

He says he wrote those, but he can't recollect what was above them.

By Mr. Wooster:

He stated there was nothing.

By Mr. Edmonds:

X526. Q. You stated your recollection to be there was nothing there?

A. There was nothing there.

X527. Q. You can't recollect whether or not there was anything in the first column for figures, but the figures that are there may have been there?

A. I don't recollect seeing those figures there. It may have been blank.

X528. Q. It may have been blank, or those figures may have been there. You don't recollect those?

A. I don't recollect those. I don't recall particularly this—I don't recall those figures in column "O," that has this caption above, in parentheses, "X 2004 C."

X529. Q. I am trying to get at just what your testimony is. You don't recall what was in that first column? The figures that are there now may have been there, or it may have been blank, so far as your recollection goes?

A. Yes; it might have been blank. I don't recall.

X530. Q. And the space immediately above, "D shoddy," you say did not have that "Diphenyl guanidine" in it? It might have been blank, or it might have had something else in there?

A. No; it didn't have anything else in there. There was nothing there written—nothing written there as I recollect, when I wrote those in the column on the left hand as they appear now.

X531. Q. Now, one further point I want to ask you about is what Mr. Daniels told you when he came back from Philadelphia, at that meeting where Dr. Kratz read his paper. What was it he told you, and if he gave you a note of anything, what was that?

A. He told me that he just came back from the meeting of the American Chemical Society, and heard

a paper read by one Kratz, who mentioned D. P. G., and he had a piece of note-paper, on which he had a table of comparison—purporting to be a comparison—on which was anilinguanidine, and diphenylguanidine and triphenylguanidine, and some figures corresponding to the names of these chemicals.

X532. Q. Figures representing their relative activities?

A. Yes, supposed to be their relative amounts.

X533. Q. Expressing their relative activities?

A. Relative amounts. One part, I recalled, of anilin, and the rest of them were fractions of one part.

X534. Q. Expressing the relative activities of those accelerators in just the way that you expressed it in your application for employment at Firestone?

A. Relative parts.

X535. Q. The answer is yes?

A. Relative parts, yes.

Adjourned until tomorrow morning at 10 o'clock.

Friday, October 9, 1925.

MORNING SESSION.

By Mr. Wooster:

I overlooked yesterday offering another exhibit for plaintiff, in the testimony of Mr. Weiss, and will recall him for this purpose.

MORRIS L. WEISS, recalled, testified as follows:

DIRECT EXAMINATION

By Mr. Wooster:

536. Q. You said yesterday that Mr. Nellen gave you the formula of a factory compound. Is that right?

A. Yes.

537. Q. Was this given orally or otherwise?

A. A written formula.

538. Q. Have you that written formula?

A. I have.

539. Q. Can you produce it?

A. Yes. This is the formula of a compound that had a code name, and the code name is written on it, which is "MYE," which Mr. Nellon informed me was a packer compound. This is put down on the righthand upper part of the sheet of paper, on which this formula is written, and is also put down opposite the line which reads, "Chromite, 4 parts." I put down in parenthesis "Diffendoe 1," in my own handwriting.

540. Q. Is there any other writing on this sheet, of yours?

A. Yes.

541. Q. What is it?

A. After carrying out this test, which was this recipe made up with Diffendoe 1 part, and after curing it, I put down the data obtained, which reads "Cure 30 minutes at 30 pounds, elongation 14½, tensile 2530, set ½.

542. Q. Is that cure reported in the X-book, and if so, where?

A. Yes, it is reported in the X-book, X 2010, column H. righthand sheet.

543. Q. Where has this paper been since you first received it?

A. It was among papers and notes that I kept in my possession all the time at my home. First it was among the notes kept at the Republic in my desk, and then taken with me and kept at my home.

By Mr. Wooster:

The original paper is offered in evidence as Plaintiff's Exhibit 5, "MYE formula."

CROSS-EXAMINATION.

By Mr. Edmonds:

X544. Q. You say this has been in your possession ever since it was made?

A. Yes, sir.

X545. Q. Why didn't you produce it in the National trial?

A. I didn't have it at that time, and I didn't happen to think of it and didn't look for it, but I found it subsequently among my papers.

X546. Q. It was in your possession all the time?

A. Oh, yes.

X547. Q. Don't you think the reason is that you saw it at that time when you were looking through your papers and looked at it and realized that it was of no consequence at all?

A. I didn't think of it at that time, but I did find it since that trial.

X548. Q. How does it happen that this didn't get burned up with everything else in the way of your personal records?

A. My personal records were at my home. The records of my work I kept at the plant, where I consulted them ever so often in conjunction with my work.

X549. Q. How did your personal records get burned up, if the fire was in the plant?

A. One of the notebooks contained records of the methods that I carried out at the Republic in producing guanidines.

X550. Q. That was in the fire and everything else was in your house?

A. Yes.

X551. Q. So the fire burned up the notebook and nothing else?

A. Nothing else.

MONROE H. DANIELS, a witness called on behalf of plaintiff, having been duly sworn testified as follows:

DIRECT EXAMINATION

By Mr. Woooster:

1. Q. What is your name, age, residence and occupation?

A. Monroe H. Daniels, age thirty-six, I reside in New York City. My occupation is superintendent and treasurer of the Gryphon Rubber Company, New York City.

2. Q. Where were you employed during the years 1918 and 1919, and first part of 1920?

A. The Republic Rubber Company, Youngstown, Ohio.

3. Q. What was your position there?

A. I was chief chemist in charge of development.

4. Q. Will you explain of what this development consisted?

A. The development consisted of finding new processes, utilization of new materials, and the investigation of a variety of things that had to do with our business.

5. Q. Do you know Morris L. Weiss, who is here present?

A. I do.

6. Q. When did you first meet him, and under what circumstances?

A. He was employed by us in 1917, to work in the analytical laboratory under Carlton.

7. Q. With what work was he engaged?

A. His first work was purely routine analysis, and such assistance as he could give to Mr. Carlton in Mr. Carlton's work.

8. Q. You are referring to Mr. Clinton A. Carlton?

A. Yes, sir.

9. Q. What did Mr. Weiss later do?

A. After Mr. Carlton left, Mr. Weiss had charge of the laboratory and it was his duty to take care of all routine work and put in whatever time he could in research.

10. Q. What kind of research?

A. In whatever problems that came to my attention, or anything that he had an idea about, that I thought should be carried out further.

11. Q. Do you recall any research Mr. Weiss carried out?

A. He continued some of the work that Mr. Carlton was engaged on, and right after Carlton left he was told to work on triphenalguanidine, the development process for the manufacture of T. P. G.

12. Q. What was the purpose of T. P. G.?

A. We wanted to develop another accelerator in the plant.

13. Q. What were you then using?

A. We were then using thiocarbanilid, which we then manufactured, paranitroso, which we also manufactured, hexamethylenetetramine which we produced.

14. Q. Did any of these materials have code or arbitrary names, and if so, what were they?

A. They were all coded. Hexa. had the code

name of "Mexa;" paranitroso was mixed up with aluminum flake, under the name of "Flaso," and thiocarbanilid had the name of "Cromite."

15. Q. Did Mr. Weiss work on any other accelerators than T. P. G., and if so, what ones?

A. Towards the end of 1918, he told me that he had an idea about the production of D. P. G., and I told him that if he had an idea, to go ahead, because I felt that we ought to have just as many accelerators in the plant, and have the use of them, as we could possibly get; and he went ahead and did some work, and I had a conversation with him, in which he told me he was working on it.

16. Q. Will you proceed with what Mr. Weiss did?

A. After he had prepared some, he told me that he had made some slabs and cures, and they looked pretty good. He showed me one or two of the slabs, and they impressed me. I told him to put whatever time he could on it, without hurting his regular routine work, and he agreed to do so. He said that the literature at hand wasn't sufficient to enable him to prepare it the best way, and he would like to look up some more of the literature, and for that purpose I told him he could go to Pittsburgh and go to the library there. That he did, and on his return he told me that he had gotten some more information, and I told him to go right ahead and use it, and put as much time to it as he could, and still keep the regular work going. I kept in touch with every member of the laboratory, that is, every head—I mean every man who did departmental work or who was responsible for departmental work, and I made a point of seeing

each of these men at least once a day, and during the early part of 1919 I talked to Weiss about D. P. G. in the course of conversation about routine and research work. I knew that the development was going on. I knew that he was trying what he had prepared in test recipes and other stocks. He prepared a fair amount of the accelerator, that is, D. P. G., which was kept in the compounding laboratory for such use as either he or I might make if it.

17. Q. Over what period did this work by Mr. Weiss on D. P. G. continue?

A. It continued during the spring and summer of 1919, and thereafter.

18. Q. To your knowledge, were any records made of this work?

A. I don't remember looking at any specific record. As I said before, I came in contact with the men in the laboratory and got my impression firsthand from conversation as to the progress of their work. I remember seeing the slabs and feeling them.

19. Q. Who showed you the slabs?

A. Mr. Weiss.

20. Q. What kind of a stock was it?

A. It was a zinc oxide test recipe, such as had been used for trying out various accelerators.

21. Q. When did he show you?

A. It was towards the end of 1918, or very early in the year 1919.

22. Q. Are these the only slabs he ever showed you?

A. I have a recollection of seeing some reclaimed rubber slabs cured with D. P. G., as the reclaimed rubber we made didn't always test uniform, I was

very much interested in finding something which would include the quality of the finished product and using our own reclaimed rubber.

23. Q. After Mr. Weiss showed you these slabs, what further work did he do relating to D. P. G.?

A. He continued to perfect the methods of production of D. P. G., both as to purity and method of production, so that we could get enough to do some real work.

24. Q. Did Mr. Weiss ever give you any D. P. G.?

A. He prepared several hundred grams, which were kept in the laboratory for his use and mine.

25. Q. When did he prepare this several hundred grams?

A. It was in the summer of 1919.

26. Q. Did you use any?

A. I don't exactly recall whether I used any for any specific compound. I had in mind the use of D. P. G. in inner tube work, and I wanted to replace the black splice with a splice that would match the color of the tube, the red tube. I had an idea, which I jotted down on a piece of paper, and I gave it to Bill Halliday in the laboratory to make up a cement for that purpose. The first one didn't work. The color wasn't any good at all, and I told Bill what I wanted done, as I didn't have time to work out everything in detail. I told Bill to take that same batch and keep adding color to it until it looked right, and told him to take the cement up into the plant, prepare pieces of tubes and make test splices.

27. Q. Was that done?

A. Yes, that was done.

28. Q. When?

A. I am not absolutely certain whether that was done in the summer or in the fall of 1919.

29. Q. Have you any records which would refresh your memory as to when these matters you have referred to were done?

A. There is a record in the X-book of the red inner tubes, and there is also one of the splicing cement.

30. Q. Which X-book is that?

A. That is the 1700.

31. Q. Who kept that book?

A. It was my book.

32. Q. Will you look at the book and pick out records you have in mind?

By Mr. Edmonds:

33. Q. X 1764, column D?

A. Yes. December 24, 1919.

By Mr. Wooster:

34. Q. In whose handwriting is this record X 1764 D?

A. That is mine. X 1773 A, B and C.

35. Q. What are the dates of these records, X 1773?

A. December 1, 3 and 11, 1919.—1777.

36. Q. Will you explain the entries on X 1777?

A. X 1777 was the result of the series of compounds that Mr. Halliday made up in the laboratory, in which he arrived at the right color.

37. Q. Have you any way of fixing the date when you wrote X 1777?

A. To my recollection, it was late in the year 1919, or early in the year 1920.

38. Q. Referring back to X 1764, in the first

column, under the letter G, I notice "Diffendoe (pure)." What does that mean?

A. That is a name we gave to diphenylguanidine dine as a sort of a code name, so that everybody would not know what is was.

39. Q. What is meant by the inscription at the top, "Match Norwalk tube"?

A. As I remember it, that was a tube made by the Norwalk Rubber Company, which had certain characteristics that were pretty widely advertised, and we wanted to match those tubes and put out something of the same quality.

40. Q. Referring to X 1773, opposite "Color," is the word "Poor," with three arrows, and opposite the date in the first column to the left of column A is an arrow in column A. Will you explain what those notations and arrows mean?

A. They mean the same as ditto marks; in other words, they refer to the preceding word or date.

41. Q. In X 1773, under the letter G, in the first column, is the word "diphenyl." What does that mean?

A. That is a name we gave to diphenylguanidine also. Until the material went right into the plant, we didn't have a final code name, because we didn't write a specification for it, and we didn't understand each other exactly, or we didn't agree exactly on the name that we were to give it. Sometimes it was diphenyl and sometimes Diffendoe.

42. Q. You mean the name you gave in your 1700 X-book did not always agree with the name that was given to the same substance in the 2000 X-book?

A. That is right.

43. Q. Referring to all these three X-book pages you have identified here, state whether or not they are in the same condition as when you wrote them?

A. No, they are not. They were in the book when I wrote them. They were bound in the book when I wrote them.

44. Q. Do you know how the sheets came to be cut out?

A. I was told by—

Mr. Edmonds:

Never mind. Let us have only direct knowledge.

A. I have no direct knowledge.

By Mr. Wooster:

45. Q. Other than that, how do the entries as they now appear compare with them when you made them?

A. On these specific pages they are, to my best knowledge, the same as when I made them.

By Mr. Wooster:

I ask that this book, being the property of the Republic Rubber Company, be marked for identification as Plaintiff's Exhibit 6. I offer in evidence as Plaintiff's Exhibit No. 7, page 1764; as Exhibit 8, I offer page 1773; as Exhibit 9, I offer page 1777.

By Mr. Wooster:

46. Q. Where did the diphenylguanidine come from with which these tests you have referred to were made?

A. Weiss prepared it.

47. Q. Then what did he do?

A. He prepared several hundred grams and had it in a bottle down in the compounding laboratory for future work. It was kept down there and was used as the compound showed.

48. Q. Can you fix the date as to when the several hundred grams of D. P. G. was in the bottle in the laboratory?

A. To the best of my recollection, it was in the summer of 1919.

49. Q. Do you recall any incident which fixes that date?

A. The first week in September I went down to Philadelphia to the open meeting of the American Chemical Society, and I had the D. P. G. before I went down there.

50. Q. How much did you have before you went to Philadelphia?

A. Several hundred grams.

51. Q. When did you leave the Republic Rubber Company?

A. April, 1920.

52. Q. When did Mr. Weiss leave?

A. March, 1920.

CROSS-EXAMINATION.

By Mr. Edmonds:

X53. Q. The accelerators that the Republic was using in 1918, and the first half of 1919, were unsatisfactory, were they not?

A. Each one had some characteristic that wasn't satisfactory.

X54. Q. You yourself appreciated the great need for something better than anything you had?

A. Yes.

X55. Q. And all through that time you were working on T. P. G., were you not?

A. Yes.

X56. Q. And that was the thing that your thought was centered on more than anything else, wasn't it?

A. You mean, through 1919?

X57. Q. Through the first half of 1919, the first eight months?

A. We were anxious to get into small plant production, so that we could get enough ahead, but I was never interested in accelerators in general, so that I could think of something else, and I did think of something else.

X58. Q. But T. P. G. was the thing that you thought most of?

A. Yes.

X59. Q. That looked most promising at that time?

A. Because we were nearer semi-plant production.

X60. Q. That was the thing that looked most promising, so you worked ahead on that, experimented with it?

A. Yes.

X61. Q. And that is the thing that Weiss was working on?

A. He was working on that and he was working on D. P. G.

X62. Q. But he was working on T. P. G. development?

A. Towards the middle, I think, of 1919, he got into a disagreement with Stephens, and I had to take him off active development of T. P. G., and Stephens, who claimed he had a process that he worked out with Eaton, really carried out a great part of the development of T. P. G., both in the laboratory and in the semi-plant production.

X63. Q. In that situation, you heard about this meeting that was to be held in September of 1919?

A. Yes.

X64. Q. And you sought permission to attend that meeting?

A. Yes.

X65. Q. You couldn't just order yourself to go, you had to get somebody else's authority?

A. Yes.

X66. And you sought that authority and got it?

A. Yes.

X67. Q. And you attended the meeting?

A. Yes.

X68. Q. You heard Dr. Kratz read the paper at that meeting?

A. I did.

X69. Q. That was in September, 1919?

A. Yes.

X70. Q. The early part of September?

A. Yes.

X71. Q. In the course of the reading of that paper, Dr. Kratz wrote out certain things on the blackboard which stood up in front of the audience?

A. Yes.

X72. Q. And among other things that he wrote

out on the blackboard were the tables that appear in the paper?

A. Yes.

By Mr. Wooster:

That is objected to as indefinite, no tables being identified.

By Mr. Edmonds:

X73. Q. To make it definite, I will call your attention to these tables labeled Table 1 and Table 2. Those are the ones that were posted on the blackboard?

A. Yes.

X74. Q. And you copied those?

A. I took notes.

X75. Q. The tables that you say were posted are Tables 1 and 2 in the paper presented at that meeting by Dr. Kratz, and prepared by him in association with A. E. Flower and Cole Coolidge, and published in the Journal of Industrial Engineering Chemistry, issued April, 1920. That is correct, is it not?

By Mr. Wooster:

Objected to. All this witness has stated is that these tables were posted on the blackboard by Dr. Kratz. He has not testified to any knowledge about Flower and Coolidge.

By the Court:

This was shown in a certain book containing an article, and he identifies those papers. That is as far as we had gone. We have to have some way to be able to identify these tables shown him.

By Mr. Edmonds:

That is the purpose of this question.

By the Court:

Simply that they are shown him in a certain exhibit.

By Mr. Edmonds:

I ask this paper just referred to be marked for identification Defendant's Exhibit "E", the tables to which the witness's attention was drawn being those appearing in the magazine on page 322, in the second column.

By Mr. Kennedy:

Plaintiff of course reserves the right to object when this paper is offered as an exhibit where it should be offered, in the defendant's case. Also reserves the right to deal with that paper as to its subject matter in its rebuttal, if that paper is offered in defendant's case.

By Mr. Edmonds:

X76. Q. When these tables were posted up in front of the audience, you wrote down in a code of your own the information given by those tables?

A. I made notes from the tables. I didn't copy them exactly.

X77. Q. Not all of them, but you copied parts, or copied data appearing there?

A. Yes.

X78. Q. Among other things, you copied enough to give you a record of your own of the information posted on the board, so far as it related to the relative accelerating value of certain of the substances, including D. P. G. and T. P. G. and anilin?

A. Yes.

X79. Q. And anilin was the substance which

you and everyone else in the rubber chemistry business were familiar with, so that you knew about its accelerating value?

A. I did not have a direct firsthand knowledge of the use of anilin. We did not use anilin at the Republic Rubber Company, and I hadn't worked with it to say any great extnt.

X80. Q. The table also included thiocarbanilid, didn't it?

A. Yes.

X81. Q. And you noted that?

A. Yes.

X82. Q. So that the figures therefore served as a comparison of D. P. G. with thiocarbanilid?

A. Yes.

X83. Q. Do you recall that in the course of the paper it was stated that D. P. G. was more active than T. P. G.?

A. Yes.

X84. Q. That was stated in the paper and shown by this matter posted on the board which you copied?

A. Yes.

X85. Q. With that memo in your possession, you went back to the Republic?

A. Yes.

X86. Q. And one of the first things you did when you got back there was to talk with some of the other officials, Mr. Clark and Mr. Jones, was it?

A. No. Mr. Clark only. Mr. Brown may have been there.

X87. Q. You don't remember whether you talked to Mr. Brown or not?

A. No.

X88. Q. But you talked with Mr. Clark?

A. Yes.

X89. Q. In your talk with him you tried to justify your trip to Philadelphia, didn't you?

A. I told him what I did.

X90. Q. And what you had gotten there?

A. Yes.

X91. Q. What did you tell him you had gotten?

A. I told him that I had been to a very interesting meeting, that I had gone to the Rubber Section meeting, and two of the open meetings, two of the other section meetings, and that I had heard pretty good papers in the Rubber Section concerning accelerators and other things, and that the paper by Kratz bore out the work that we had done previously and substantially our own ideas that we had arrived at before.

X92. Q. You reported to him that the Kratz paper was one of the most interesting papers you had heard on the subject of accelerators, didn't you?

A. I don't remember that definitely.

X93. Q. That is a fact, isn't it, you had never heard any paper on accelerators as interesting as that?

A. That is a fact.

X94. Q. Nor any paper that gave as definite information as that?

A. That is true.

X95. Q. In fact, up to that time, rubber chemists had rather refrained from publishing things about accelerators, hadn't they?

A. Yes.

X96. Q. And this paper of Dr. Kratz's marked a reversal of tendency in that respect, don't you think?

A. I think so.

X97. Q. Since then rubber chemists have been much more free in giving out information in printed papers read at the society meetings.

A. Yes.

X98. Q. As a matter of fact, some one of the men with whom you talked possibly Mr. Clark, knowing what difficulties you were having in devolping a process of making an accelerator that would be satisfactory to you, asked you if you had gotten the dope at the Philadelphia meeting, and you said yes, you had gotten the dope? Isn't that so?

A. As to the making of the accelerator?

X99. Q. Not as to the process; as to what would serve as a suitable accelerator?

A. I don't remember that.

X100. Q. You and everyone else realized that what you had in the way of accelerators was not as good as you wanted. As you said, they were unsatisfactory, and you of course were looking for a satisfactory one.

A. We were looking for more accelerators, each one of which would have its own characteristic suitable for our use.

X101. Q. You don't remember that some one asked you if you had gotten the dope, and you said you had?

A. I don't remember that.

X102. Q. Now, after this talk with Mr. Clark and possibly with Mr. Brown, you talked with Weiss?

A. Yes.

X103. Q. You showed him this note which you had made of Dr. Kratz's information?

A. Yes.

X104. Q. And you talked with him about that?

A. Yes.

X105. Q. And you said it looked to you as D. P. G. was much superior to T. P. G.?

A. I told him that Kratz's paper showed about the same results that we had gotten in general.

X106. Q. You said to him it looked to you as though D. P. G. had a great deal on T. P. G., to use your own expression?

A. I think I said that.

X107. Q. And you said you wanted him to do some work on D. P. G., didn't you?

A. I don't remember that conversation.

X108. Q. You said you wanted him to continue work on T. P. G., but you wanted him to work on D. P. G. also, didn't you?

A. I had given him that instruction long before that.

X109. Q. In the National case, in which you testified, you said, "I took a few notes of the meeting and called him, Weiss, into my office when I came back, and went over them with him and told him that it looked to me as though D. P. G. had a good deal on T. P. G., and while I would like to get the semi-commercial plant in production, I also wanted some work done on D. P. G." You recall testifying that way don't you?

A. Yes.

X110. Q. That statement as you gave it there is correct?

A. It is correct as it is, but my recollection is that I had talked to him long before that along exactly the same line. That was simply a repetition of what I had talked to him before. Whenever I had a conference with him, and D. P. G. came up, I encouraged him. I wanted him to go ahead.

X111. Q. As a matter of fact, from the time of that talk that you had with Weiss immediately after your return from Philadelphia, following this instruction that you gave him to work on D. P. G., there was a succession of tests with D. P. G. made in the Republic laboratory through the remaining months of 1919. That is true, isn't it?

A. Yes. We had more material to work with.

X112 Q. And you find all of those tests recorded in the X-book, do you not?

A. I haven't looked over the X-book for that particular purpose. I have identified my own.

X113. Q. Now, you were in charge of this laboratory where Weiss works?

A. Yes.

X114. Q. Did you say that the people under you, or do you say that the people under you, in that laboratory, were allowed to use their discretion as to what they made a report of?

A. No, I didn't say that.

X115. Q. I say, you don't say that now, do you?

A. No.

X116. Q. It was your instruction that they record everything in the books provided for that purpose?

A. Yes.

X117. Q. That was the rule of the company, was it not?

A. That was the rule. We had no written, definite, formal rules. We had certain instructions which were given to each man as he was engaged.

X118. Q. Was it your understanding that everything that was done in the way of testing rubber compounds was reported in the X-books that were provided for the purpose?

A. Yes.

X119. Q. If rubber tests were made and not recorded, it was not with your knowledge?

A. Yes, that is true.

X120. Q. And if you had known about it, you would at once have given instructions to have them recorded?

A. Yes. There were times when in the press of work—I know I have done it myself—that compounds were made up from notes and not recorded immediately. They were recorded a short time afterwards.

X121. Q. In the National case you were asked whether, following Weiss's trip to Pittsburgh, in January of 1919, you gave him any other directions as to investigating outside of the plant for this line of accelerators, and you said, "No, none that I remember. We were very much interested in triphenylguanidine. I had that in mind more than anything else." Do you recall testifying that way?

A. Yes.

X122. Q. And that is perfectly correct now as it was then?

A. I had triphenylguanidine in my mind more than anything else, because we had gone to the expense of putting up a small plant. I wanted to get that plant in production, but so far as research work,

getting new accelerators, is concerned I was also very, very much interested in D. P. G.

X123. Q. The active development work of the company was on T. P. G. up until the time you came back from that Philadelphia trip?

A. A small plant production, yes.

X124. Q. That was the active work in the development of accelerators?

A. Yes.

X125. Q. Do you recall any question being raised along in the summer of 1919, as to continuing Weiss's employment?

A. No, I don't.

X126. Q. You don't remember discussing with others there whether or not he should be continued in the employment of the company?

A. No, I have no recollection of that. In the summer of 1919?

X127. Q. Yes.

A. No, I have no recollection of that.

X128. Q. You don't remember discussing that with others like Mr. Clark and possibly Mr. Brown?

A. No.

X129. Q. Do you remember advertising for some one to take his place?

A. No.

X130. Q. No recollection of that at all?

A. No.

X131. Q. You don't know whether it was done or was not done?

A. No, I don't.

X132. Q. You and Weiss left at approximately the same time? Your services were discontinued by the company just as Weiss's were?

A. Within a month I resigned.

X133. Q. If anything new had been developed around the plant there, in the way of accelerators or chemicals generally, and had come to your attention, to whom would you have reported it?

A. I would have taken it up with Clark.

X134. Q. Did you ever take up this D. P. G. matter with him?

A. I think I did, yes.

X135. Q. Have you any definite recollection about it?

A. I think I talked that over with Clark in the spring or summer of 1919. I told him we were doing something with it, but I wasn't prepared to say how good it was.

X136. Q. I show you what I believe to be a copy of an affidavit signed by you and filed in the District Court of New York, in connection with the motion for preliminary injunction in the National suit. Will you look at that and state whether or not you recognize that as a copy of an affidavit signed by you?

A. Yes.

X137. Q. On page 2 of that affidavit there is a statement, as follows: "Upon said Weiss's return from Pittsburgh, Pa., I instructed him to devote as much time as possible in triphenylguanidine, as that substance was the one in which I was most interested at that time, although I consented to further investigation of diphenylguanidine as an accelerator." That statement you maintain is correct at the present time?

A. Yes.

X138. Q. Now, if you will remember, in the course of the proceedings in connection with that

motion, some of the affidavits referred to a man by the name of Eaton?

A. Yes.

X139. Q. And whether or not he had done certain things with D. P. G. at the Republic laboratory—

By Mr. Kennedy:

Objected to. It is not concerned with statement of things that this witness did.

By the Court:

He is simply making a statement. I cannot tell yet whether this has any relevency or not.

By Mr. Edmonds:

X140. Q. It was in that connection that you stated in this affidavit at the bottom of page 4, as follows: "I personally have no knowledge of his (meaning Eaton) working to any extent whatever on either triphenylguanidine or diphenylguanidine, which knowledge would naturally have come to me in the regular course of his laboratory work, if something had been included therein, and such work, if done by said Eaton, would have been reported in the laboratory X-book." That, of course, refers to Eaton. Would you not say just the same thing about Weiss, that his work done would appear in the X-book?

A. No.

X141. Q. You think there is a difference between Eaton and Weiss in that respect?

A. Yes; because Eaton was doing purely chemical work, with no compounding. Weiss was doing chemical work and compounding. He was testing out his resutls.

X142. Q. This statement about Eaton refers to a

claim by him that he had made a test slab of rubber with D. P. G. Now, if Weiss claims to have made a test slab of rubber with D. P. G. in it, wouldn't you say this same statement would apply with equal force to both, that if the work had been done it would have been recorded in the laboratory X-book?

A. As a theoretical question, yes.

X143. Q. Now, you recall that you sent Stephens to New York to search any the literature in the public library or elsewhere, along in the fall of 1919, and he went there in accordance with your instructions?

A. Yes.

X144. Q. You recognize as your own this letter that I now hand you, do you not?

A. Yes.

X145. Q. The letter is marked Defendant's Exhibit "F" for identification. At that time you were seeking information as to how to make D. P. G. in quantity at a cost that would permit of its use commercially?

A. I wanted more information as to the process. Stephens was the man whom we employed to do chemical engineering work; that is, he designed and constructed the semi work production plant, and I had talked to Stephens some time before that in the summer about the possibility, if T. P. G. would get to the point where it could be moved to a bigger plant, or it would be worth while making a bigger plant, whether the semi works plant could be shaped over to manufacture D. P. G.; in order for him to give me an idea of what it would mean in material and cost, he had to know something about the process.

X146. Q. It is evident to you from this letter, is

it not, that he reported to you while he was in New York, and his report indicated more or less about what he was doing?

A. Yes.

X147. Q. And you found evidently from one of his reports that he was doing some searching in connection with T. P. G.?

A. I asked him to.

X148. Q. And it is evident from this letter that he did do it?

A. Yes.

X149. Q. You wrote him in this letter that this T. P. G. you had been working on for months, was a dead issue, and you wanted him to stop work on that?

A. I didn't write him it was a dead issue.

X150. Q. Not in those words. You wrote him that you were through with T. P. G.—Those were the words?

A. That is right.

X151. Q. This thing that you had been working on for months and months, in trying to develop and make a commercial plant for, you were through with, and you told him to work on D. P. G.?

A. Yes.

X152. Q. To use your own words, you said, "That is the king-pin now."

A. Yes.

X153. Q. And that was shortly after the Kratz paper was read?

A. Two months.

X154. Q. Now, I wish to call your attention to another statement in this affidavit of yours, on page

6. Just after telling about your trip to this Philadelphia meeting, you said, "I did, however, upon my return from Philadelphia, immediately tell Mr. Weiss that the statements made in the paper read by said Kratz confirmed our experience with D. P. G., as to accelerating, and that we should continue to work on that substance and develop a commercial process if possible." That statement was correct when you made it and is correct now?

A. Yes.

REDIRECT EXAMINATION.

By Mr. Wooster:

155. Q. When you took Mr. Weiss off the work on T. P. G., what did he do?

A. He kept up with his regular routine work, and he did work on D. P. G.

156. Q. What kind of work on D. P. G.?

A. Development of the process of making it and testing it.

157. Q. Do you remember any feature of that process?

A. I remember the fact that he told me about the use of ammonium nitrate as a better material, rather more effective and cheaper material than using alcoholic ammonia, which would have been impractical.

158. Q. Relative to your trip to Philadelphia, when did he tell you about ammonium nitrate?

A. To my best knowledge, it was before.

159. Q. Is the Kratz paper the only paper you heard read at that Philadelphia meeting?

A. Oh, no.

160. Q. What other papers did you hear read?

A. There was a paper on accelerators by Mr. Scott, formerly of Goodrich. There was a paper by an assistant of Mr. Wiegand, about compounding materials. I think the heavier of certain compounding materials, when the resulting vulcanizing stock was stretched. He had a clever experiment, which I remember. There was a paper on the variability in crude rubber that I think Tuttle either gave or discussed.

161. Q. Did you hear a paper by D. F. Cranor?

A. Yes.

162. Q. What was that paper about?

A. That was on accelerators, and I think he compared assels also. I am not very clear on that.

163. Q. Did you attend a reading of other papers on chemical subjects than merely rubber or rubber compounding?

A. Yes, I attended the first open meeting in general and physical chemistry, and I looked in on the organic section once.

164. Q. What became of the T. P. G. plant which Mr. Stephens worked on?

A. He worked at it for a while, producing small quantities, and then I think when I found out that the company was running badly financially, I knew that a good deal of this sort of work would have to be stopped, and we stopped using the plant.

165. Q. Did the Republic Rubber Company, after you stopped using this plant, continue to use T. P. G.?

A. T. P. G. was never used to any great extent in the plant while I was there.

166. Q. Was T. P. G. offered in the market at this time?

A. I think it was.

167. Q. So that there were other sources of supply for whatever the Republic desired than merely what you made yourself?

A. Yes.

RECROSS EXAMINATION.

By Mr. Edmonds:

X168. Q. Do you know how much T. P. G. is used now?

A. No, I have no knowledge of that.

X169. Q. No idea at all?

A. I think a fair amount is used.

X170. Q. Do you think as much as 40,000 pounds a month are used?

A. Yes.

By Mr. Wooster:

X171. Q. When did you return from that 1919 chemical meeting at Philadelphia?

A. As soon as it was over; I think it was over on the 6th, and I was back on the 7th.

ARTHUR H. NELLEN, a witness called on behalf of the plaintiff, having been duly sworn testified as follows:

DIRECT EXAMINATION.

By Mr. Wooster:

1. Q. What is your name, age, residence and occupation.

A. Arthur H. Nellen; age twenty-nine; Conshocken, Pa.; chief chemist and assistant superintendent of Lee Rubber & Tire Corporation.

2. Q. Where were you employed during the year 1919?

A. At the Republic Rubber Company, and also with the Firestone Tire & Rubber Company.

3. Q. Will you give the dates between which you were employed by the Republic Rubber Company?

A. February 1, 1919, to November 1, 1919.

4. Q. What was your position?

A. Compounder for mechanical goods, shaped, molded articles.

5. Q. Will you name those articles, or some of them?

A. Small miscellaneous molded mechanical goods, such as plumbers' supplies, heels, soles, and so forth, and also handmade articles, such as packers and wringer rolls.

6. Q. At this time were you familiar with the nature and operation of rubber accelerators?

A. Yes.

7. Q. Did you use them in your own work?

A. Yes.

8. Q. Which ones did you use?

A. Thio. and hexa.

9. Q. What were the code names, if any, for those?

A. Cromite and Mexa.

10. Q. Are you acquainted with Morris L. Weiss, who is here present.

A. Yes.

11. Q. When did you first meet him?

A. Late in 1917.

12. Q. Where?

A. Youngstown.

13. Q. When did you next meet him?

A. February, 1919.

14. Q. Where?

A. Youngstown.

15. Q. At what place?

A. The Republic Rubber Company's factory.

16. Q. Was he ever employed there?

A. Yes.

17. Q. While you were there?

A. Yes.

18. Q. Did you and Mr. Weiss ever discuss accelerators?

A. Yes.

19. Q. Did he ever disclose any accelerator to you?

A. Yes.

20. Q. What was it?

A. D. P. G.

21. Q. Meaning—

A. Diphenylguanidine.

22. Q. When did he make such disclosure?

A. I don't remember.

23. Q. Between what dates did he make it?

A. Between February 1, 1919, and November 1, 1919.

24. Q. I show you Plaintiff's Exhibit 5, and ask you if you recognize it.

A. Yes.

25. Q. What is it?

A. It is a formula for a stock used at the Republic Rubber Company for making a certain grade of packers, used in oil wells.

26. Q. State what you know about this paper?

A. Some time during the time I was employed at

the Republic Rubber Company in 1919, Weiss discussed D. P. G. with me, in relation to using any cheap shoddy compound, and he asked me at that time for a formula which he could use, which would make a practical factory test on D. P. G., and I scratched off this formula and gave it to him.

27. Q. State which is your handwriting on this exhibit?

A. Just the letters "NYE" at the top and the line. That and also the actual formula totals 100. That is all. That is the names of the ingredients and the percentages.

28. Q. What does "NYE" mean?

A. Those are the letters that were given as a name to the stocks when they were actually used in factory production.

29. Q. What does "Cromite 4" mean?

A. Four per cent of Cromite in the formula.

(No cross examination.)

WILLIAM HALLIDAY, a witness called on behalf of plaintiff, having been duly sworn, testified as follows:

DIRECT EXAMINATION.

By Mr. Wooster:

1. Q. Please state your name, age, residence and occupation?

A. William Halliday; Hubbard, Ohio; age fifty-six; occupation, railroad and utility man.

2. Q. Where were you employed between April, 1914, and March, 1922?

A. Republic Ruber Company, Youngstown, Ohio.

3. Q. What was your position at the Republic Rubber Company during this time?

A. Well, I guess you would call it physical work for research chemists. I never knew a name for the position.

4. Q. What did you do?

A. I weighed the compound and then mixed it in the mixing mill, and then took the stock and cured a sample of the rubber, as per their request.

5. Q. What substances did you use in mixing the rubber?

A. Whatever they had written on the paper. I couldn't keep track of those.

6. Q. Do you remember some of the names they wrote down?

A. Quite a number of them.

7. Q. Give them?

A. Smoke sheets, para rubber, Ceylon, Borneo, and different groups, brown crepe No. 1, 2 and 3, zingu, possibly there were another one or two, but I have forgotten. There were a lot of shoddies that were named A, B, C, D, E, F, G, and also some other names, usam. I don't believe I can recall any other now. A lot of compounds, aluminum flakes, zinc, ponolith, different clays they had samples of. There was a large number of those that I could refer to by just stepping into the room. Every article I had was indexed, so that I could get the names of any article and refer the recipe to the name, and get the ingredient I wanted.

8. Q. Did you ever know of any substance there as "kickers"?

A. I sure did.

9. Q. What were they?

A. It was a compound that we always added in a small quantity to shorten the time and amount of heat used to cure a piece of rubber.

10. Q. Do you remember some of the names of these kickers?

A. Yes. The first one was cromite, that I got familiar with, and it followed up with difan, diffendoc, and flaso, or flakes, and D. P. G. I believe that is all I can recollect at present.

11. Q. Do you know Morris L. Weiss, who is here present?

A. Yes.

12. Q. When and where did you meet him?

A. At the Republic Rubber Company, during the latter part of 1918, it runs in my mind. I wouldn't state positively just the exact time. It was when he first took the job there that I met him first.

13. Q. What did you have to do with him?

A. Merely to satisfy his requests as far I could That was all. If he made a request to mix a compound, cure samples for him, it was my duty to do so, and turn the slab over to him, or whatever he should require in the way of curing and mixing rubber.

14. Q. Will you state what his custom or varying customs were, as to giving you instructions on materials?

A. Well, I considered him a very secretive fellow, and for a time was not very friendly toward him on that account. I had obtained the confidence of every one of the fellows, and I was rather sensitive about his secretiveness, and I endeavored not to hand him any favor, only just directly what he asked. Then

possibly two months or something like that later, he became more friendly with me, and I made up my mind I was going to find out what had happened to samples that he had me cure for him, and that I was going to win his confidence. So began getting more friendly with him.

15. Q. Referring to these samples you just mentioned, did he bring you a compound all milled and ready to cure, or part of it, or tell you what to do?

A. He had it weighed, and that irritated me, I remember distinctly, because it looked to me in the face of it that he wouldn't trust to my weighing. He weighed it, and he set it down alongside of the mill, and called across the room to me, and said, "Bill, when you get ready to mix this, call me. I would like to watch it mix." I delayed it until possibly three o'clock in the afternoon, and that I think was immediately after lunch, if I am not mistaken, when he placed it by the mill. I had thrown the rubber into the mill and was breaking it down, and I called him, and he came downstairs immediately with a small beaker in his hand with some white powder in the bottom of it, and he said, "Tell me when you want to throw this in." I said, "Throw it in the compound, put it all in together." He threw it in the compound, and after I got my rubber broken down, I went on with it and took it off. In the meantime I asked him what kind of a sample he wanted cured. He said a slab, a 3/32. That is the way I determined what samples he wanted. Then I sheeted the rubber as I took it off the mill, according to the requirement of that sample. I removed that and got the shape to make a 3/32 slab, and laid it on the table, and he followed me around

and asked me to make a cure for him, and I did that. I said, "Put that on a piece of paper, because I can't handle that this evening." I remember now I couldn't handle it, I wouldn't have time in the length of time I had. It seemed to me it was about an hour. The length of time had been getting to run past my quitting time, and he asked me if I would do it the first thing in the morning, and I said I would at seven o'clock in the morning. So I placed that in the press in the morning, and when the time came to remove it, it broke right off in my fingers. I said, "You have something pretty rotten here," and threw them on the resk and said, "How do you like that?" And I walked away and went downstairs and went on with my other work. Possibly fifteen or twenty minutes after that he came running down and asked me if would give him another cure on that, and I said "Sure." So he gave me another to cure, which was diminished, it seems to me, fifteen or twenty minutes, with the same pressure of steam. I made that cure. I imagine that came at just lunch time. Yes, I waited two or three minutes after the whistle blew to remove it from the press, and I threw it on the table and went to lunch, and when I came back he said, "Is that other cure off?" I said, "There it is on the table." He took that upstairs himself and late in the afternoon told me he would like another cure, or rather in the middle of the afternoon, possibly two o'clock. I asked him, "How much time do you want on it?" And it was something like twenty minutes or twenty-five. I know he cut it more than half in two from the original cure. I made that cure for him immediately and took it upstairs to him, and he thanked me for it, and I went on with my work.

16. Q. Did he tell you what the name of the white powder was?

A. Not on your life, no.

17. Q. You mentioned in the previous answer difan, diffendoe, difenylguanidine. When did you first hear those terms?

A. It was a long time after that that I got familiar with those. Possibly the next spring or summer that I became familiar with those names, and I didn't have any of that in stock at that time. It was later. Just at that time, it is on my mind, I became familiar with the word "triphilum," which I considered was an accelerator. I can't remember of anyone ever telling me it was, but I considered it from my own personal experience as being an accelerator.

18. Q. Who made known to you the terms diphenyl, diffendoe, diphenylguanidine?

A. That occurred when I would get a quantity. They would say, "We will call this so-and-so," and sometimes it would be one and sometimes another. Just who gave me the individual names I don't believe I am able to answer, as I had seven or eight fellows to deal with continuously that were coming in on me every fifteen or twenty minutes, and it slipped my mind just who would give me the names.

19. Q. At any time did you ever have in your place any quantity of diphenyl or diffendoe, diphenylguanidine?

A. Diffendoe I kept in a tin box that was eleven inches high and seven inches in diameter. It was called diffendoe. It was a white, grayish powder, and I marked with yellow crayon chalk on the can what the ingredient was.

20. Q. Can you recall when you first had that material there?

A. It was in 1919, I believe, that I obtained that large can.

21. Q. Where did you obtain it from?

A. It came from upstairs. Mr. Weiss, I believe, brought it down and told me that Daniels said it would be called diffendoe.

22. Q. Who do you mean by Daniels?

A. Mr. Daniels, the chief chemist. He was my foreman.

23. Q. How did this powder which you call diffendoe compare in appearance with that which you first used, as brought to you by Mr. Weiss in the beaker?

A. Nothing only in appearance, and I never classed them together at all. I didn't know it was the same thing, because I had nothing to do with it, only to watch him drop it in the can. It was all a mixture of compound after that.

24. Q. Do you recall any incident which refreshes your memory as to when this first set of cures with the white powder brought to you by Mr. Weiss was made?

A. Yes; that was in the winter, either the latter part of 1918 or the early part of 1919.

CROSS-EXAMINATION.

By Mr. Edmonds:

X25. Q. In this rubber batch that you said he made these three slabs from, did you measure out the ingredients and put them together?

A. No.

X26. Q. You had nothing to do with that at all?

A. Not with that, no.

X27. Q. Have you any way of telling how much sulphur was in that compound?

A. None whatever.

X28. Q. You didn't know anything about that?

A. No.

X29. Q. How large was the original batch?

A. That was half a batch. I remember he spoke to me first about letting him know. He said, "Can I use a thousand grams on that?" I said "I don't know what you have in it." He said, "I have only got ten grams"—no, five grams, he said. It was a very small quantity.

X30. Q. I asked you how much the batch was?

A. Five hundred grams.

X31. Q. Do you recall which side of the mill Mr. Weiss stood on as he talked with you?

A. On my righthand.

X32. Q. How do you recall? He had his left hand in his pocket too? Don't you recall that?

A. I do not. My back was to him. I wasn't looking at his hand.

X33. Q. Do you remember he stood on the left-hand side of the machine?

A. No, on my right-hand.

X34. Q. That was when he first came up and spoke to you?

A. No.

X35. Q. Where did he stand then?

A. I was working on my table on other work when he came down and approached me then. At the same time he was talking. That was before the compound was brought to me at all.

X36. Q. Both days when he came down and talked to you—

A. The same day.

X37. Q. And the second day he came down and stood on the same side of the machine?

A. It was all the same day, within a few minutes.

X38. Q. All this happened within a few minutes?

A. Yes.

X39. Q. The making of these three batches?

A. One batch.

X40. Q. This one batch you made in a few minutes?

A. Yes, sir.

X41. Q. About that time you were running these batches through the mill time after time, weren't you?

A. There was only the one batch.

X42. Q. I am talking about your general work. That was what you were doing right along, making batches of rubber of that sort?

A. A part of the time I was occupied in pressing the samples and curing.

X43. Q. For instance, about how many batches would you say you would make up and run through the mill each week?

A. A week?

X44. Q. Yes.

A. I never estimated it.

X45. Q. Do you think it would be about ten?

A. Oh, fourteen or fifteen in one day.

X46. Q. Fourteen or fifteen in one day?

A. Yes.

X47. Q. And that continued through the years 1918 and 1919?

A. Yes.

X48. Q. And 1920?

A. Yes.

X49. Q. Also 1921?

A. Yes.

X50. Q. And 1922, until you left?

A. Yes.

X51. Q. It was also true during 1917?

A. Yes.

X52. Q. And 1916?

A. Yes.

X53. Q. You would average about fifteen a day?

A. Very close to that. It possibly would have been lower for an average. I have reached as high as thirty-one in one day. The minimum I have seen as low as four or three, maybe.

X54. Q. When you put through as many as thirty-one a day, it kept you going pretty strenuously?

A. I think so, and I called for assistance.

X55. Q. And that would run right through the week of six days?

A. Yes.

X56. Q. And week after week all through the year?

A. Yes.

X57. Q. In the course of a year you would run up into thousands, probably?

A. I would say so.

X58. Q. Possibly many thousands.

A. If I looked at it that far away, I would get groggy.

X59. Q. You made many of these tests at Mr. Weiss's request, didn't you?

A. Yes, quite a large number.

X60. Q. It was quite the usual thing, that is, he was one of the chemists for whom you had to do these things?

A. Yes.

X61. Q. About how many of these chemists were there that you made these tests for?

A. Do you mean, throughout my entire experience?

X62. Q. At one time, at any one time.

A. Well, sometimes four and sometimes five; I believe it reached six at one time, if I am not mistaken.

X63. Q. If there were six of these chemists, you made thirty tests in one day—Each one of these chemists would average five?

A. But it didn't average up at all.

X64. Q. Fourteen or fifteen would be more of an average.

A. Lots of times I would have one from a man and other times I would run four or five for the same man.

X65. Q. The same day?

A. Yes. And I have seen Mr. Daniels, where we were running for color—one day we ran fourteen, but not all mixtures, that is, a complete mixture.

X66. Q. All fourteen for one man?

A. Yes, by merely taking that piece of rubber back to the mill and adding some more color. In that case it would be a very small piece of rubber, an inch wide and six inches long. He was keeping

track of the percentages that I was getting with that on request.

X67. Q. Sometimes you would do that for Mr. Weiss?

A. Not as elaborate as that.

X68. And he would stand there by the machine?

A. No, only that one time that he gave such a thorough examination.

X69. Q. I mean, when you made the series of tests when they would change the percentage of each time, would he stay there?

A. No, he would give me the recipe and ask me to get at it at my earliest convenience. Then I would weigh the compounds and mill them to what I thought would satisfy him. I didn't call him after that.

X70. Q. You were there with the Republic about eight years?

A. Yes, from 1914 to 1922.

X71. Q. You must have made as many as 50,000 tests in those eight years, don't you think.

A. I don't know. That may be pretty strong, because I haven't placed that average at thirty. That average might be nearer fifteen, even as low as twelve possibly an average would be struck.

X72. Q. That would be about a hundred a week? and five thousand a year, and that would make about forty thousand tests?

A. Maybe it reached that, but I never gave that a thought.

VAN LEAR WOODWARD, a witness called on behalf of plaintiff, having been duly sworn, testified as follows:

DIRECT EXAMINATION.

By Mr. Wooster:

1. Q. What is your name, age, residence and occupation?

A. Van Lear Woodward; New York City; thirty-five; vice president of Dovan Chemical Corporation.

2. Q. That is the plaintiff here?

A. Yes.

3. Q. When was the plaintiff corporation formed?

A. In February, 1921.

4. Q. To what business did it succeed?

A. It succeeded the partnership comprised of M. L. Morris, H. F. Doty and Van Lear Woodward.

5. Q. When was this partnership formed?

A. In April, 1920.

6. Q. Did you hear an agreement mentioned yesterday in the testimony of Mr. Weiss of that date?

A. I did.

7. Q. Is that the agreement under which the partnership was formed?

A. It is.

8. Q. When did you first meet Mr. Weiss?

A. The latter part of March or the very first few days of April, 1920?

9. Q. What was the occasion of that meeting?

A. Mr. Weiss was brought into my office by Mr. Doty, and he discussed with us the chemical sub-

stance that he had as an accelerator for the vulcanization of rubber.

10. Q. Did he tell you what it was?

A. He did not tell us what it was.

11. Q. Did he tell you what it was before the agreement was signed?

A. At the time the agreement was signed, he told me what it was.

12. Q. Did the partnership engage in any business?

A. Oh, yes.

13. Q. What was its business?

A. Manufacturing and selling diphenylguanidine.

14. Q. Commenced when?

A. Our first production was at the end of July or the first few days of August, 1920.

15. Q. At this time was any other manufacturer offering diphenylguanidine in the market as an accelerator for the vulcanization of rubber?

A. No.

16. Q. How many pounds of D. P. G. was made during the year 1920, approximately?

A. Approximately 200 pounds.

17. Q. How many pounds were sold?

A. Fifty-three pounds.

18. Q. What became of the rest?

A. We gave it away as samples.

19. Q. To whom?

A. To rubber manufacturers that we were endeavoring to interest in the use of the product.

20. Q. To how many rubber manufacturers did you distribute samples?

A. Seventy-five to eighty.

21. Q. What was the response?

A. At that time?

22. Q. At that time.

A. The response was very slow. They wanted to further test it out before they would consider its use.

23. Q. Did they ask any questions about it?

A. As to what it was, very much so.

24. Q. Anything else?

A. They wanted to know what its nature was, what it would do, what its cost was, what we knew of it as to the results that could be obtained from it—information along those lines.

25. Q. Anything else?

A. I can't recall specifically anything else they asked.

26. Q. What do you mean by "nature?"

A. Whether it was a powder or whether it was a gum, or whether it was finely divided, whether it was white or black.

27. Q. Were you ever asked if it was toxic?

A. Yes, that was a very usual question.

28. Q. Why was that?

A. Because the accelerator then most commonly used was known to be very poisonous to the men using it.

29. Q. What was that?

A. Hexamethylenetetramine.

30. Q. What other accelerators were on the market at the time, in 1920, when you offered D. P. G.?

A. Paridianinodiphenyl, thiocarbanilid, lead ole-

ate, small quantities of paranitroso, and small quantities of triphenylguanidine.

31. Q. Did you ever contemplate the manufacture of triphenylguanidine?

A. I did.

32. Q. When?

A. In 1918.

33. Q. Did you go into it?

A. We erected a plant for the commercial production of it, but we never produced or sold it commercially.

34. Q. What was the experience of the Dovan Chemical Corporation, commencing from its incorporation, in February, 1921, and the preceding experience in 1921, of the partnership, as to the pushing of D. P. G.?

By Mr. Edmonds:

I offer the objection that it is all irrelevant and immaterial.

By the Court:

You are entitled to show his experience to some extent. The objection is overruled.

A. The Dovan Chemical Corporation continued its sales efforts through the States Metals Company, and commencing about the middle of the year 1921 developed ever-increasing and rapidly-increasing sales to rubber manufacturers of diphenylguanidine.

35. Q. Subsequent to 1921, what happened?

A. Right up to the present time we have produced and sold each year considerable more than our production and sales of the previous year.

CROSS-EXAMINATION.

By Mr. Barrows:

X36. Q. The Dovan Chemical Corporation is not engaged in the vulcanization of rubber, is it?

A. Not commercially.

X37. Q. It never operated commercially under this patent in suit, in carrying out the process of this patent.

A. It has never made rubber articles for sale to the public.

X38. Q. Its purpose is the manufacture and sale of D. P. G.?

A. Yes.

X39. Q. And you manufacture it by your own special process or processes?

A. Yes.

X40. Q. And that process is the subject matter of another patent owned by this plaintiff?

A. The process we have used is the subject matter of a patent.

X41. Q. A patent of the same patentee of the patent in suit?

A. Yes.

X42. Q. The patent which is referred to in the patent in suit, or the application which is referred to in the patent in suit?

A. I don't get the question.

X43. Q. The other patent under which plaintiff is operating is referred to in the patent in suit, or identified by this application.

A. The patent on the process of the manufac-

ture of D. P. G. is referred to in the patent in suit, and it is a process that we have used.

X44. Q. It is a process on which your first manufacture of D. P. G. was based, isn't it?

A. Yes.

X45. Q. And you never would have gone into the business if you hadn't had a process for making it commercially?

A. Very probably not.

X46. Q. So far as you know, there was no other process available at that time for making D. P. G. commercially?

A. I didnt know of any.

X47. Q. You referred to sending out letters to the trade at the time you began business. You have been sending out similar circulars ever since, or at different times since then?

A. Yes.

X48. Q. Do you recognize this as one of the circulars which you sent out?

A. That is a pamphlet that we distributed.

X49. Q. How long ago?

A. 1923.

X50. Q. This contained recommendations that you were making to the trade at that time?

A. As a type of compound.

X51. Q. And information that would be of value to the trade?

A. Of general interest, not specific interest.

X52. Q. In this pamphlet it is stated that "D. P. G., unlike many other accelerators, is very active when present in very small amounts, and its activity increases almost proportionally to the increase of

D. P. G. up to about .75 parts with 100 parts of rubber." That statement is one of the recommendations or pieces of information you supplied to the trade?

By Mr. Wooster:

Objected to. Witness is not qualified by the direct examination to answer cross-examination of the nature of expert testimony.

By the Court:

Ask him if that was a circular they sent.

By Mr. Edmonds:

The question is withdrawn. I ask that the circular be marked Exhibit "G" for identification.

X53. Q. You have acquired a great deal of information about D. P. G. since 1920 that you didn't have then?

A. Yes.

X54. Q. And the circulars you sent out in 1920 were not nearly as complete or informative as the circulars you sent out more recently.

A. I am not generally familiar with technical circulars. If you will refer to letters that I wrote myself, I will discuss them.

X55. Q. I show you one of the circulars which was filed during the Patent Office proceedings as Exhibit "C," attached to an affidavit which I think you just identified. This is one of the circulars that you sent out in August, 1920, or had sent out on your behalf?

A. The letter was sent by our Akron representives.

X56. Q. With your knowledge and approval.

A. Yes.

X57. Q. And one of the things that you pointed out in this letter was that D. P. G. could be obtained at a price that made it available as a commercial accelerator?

A. Yes.

X58. Q. And that you were in a position to supply quantity production?

A. Yes.

By Mr. Edmonds:

I ask this be marked Exhibit "G" for identification, the sheet referred to being the sheet that has just been shown to the witness, and which forms a part of the file record of the patent in suit, as an exhibit annexed to an affidavit of Henry S. Doty.

X59. Q. You say you first met Mr. Weiss, the patentee of the patent in suit, late in March or early in April of 1920?

A. Correct.

X60. Q. And the first time he came to see you he gave you a sample of material, but he didn't tell you what it was?

A. That is right.

X61. Q. What did you do with that sample?

A. Mr. Doty had possession of the sample.

X62. Q. Do you know what was done with it?

A. I know from what Mr. Doty told me, that he tested it.

X63. Q. And then you thought the test pretty good?

A. We considered the test very good, in the light of Mr. Weiss's remarks to us at the time he gave us the sample.

X64. Q. And then you and Mr. Doty and Mr. Weiss came to an agreement and went into business.

A. Yes.

X65. Q. Those tests were the ordinary tests of a rubber chemist in mixing the accelerator in the rubber compound and testing it in the laboratory.

A. I prefer not to state specifically what the tests were.

X66. Q. So far as you know, it was the ordinary test of rubber chemists.

A. As far as I know, they were tests that Mr. Doty applied to that sample, in accordance with suggestions given by Mr. Weiss.

X67. Q. And the test, together with what Mr. Weiss told you, satisfied you that this was something worth going into?

A. Yes.

X68. Q. Did Mr. Weiss tell you that he also had a new process for making this, which would enable you to make it commercially?

A. I wouldn't recall whether that was discussed at the first meeting, but probably it was.

X69. Q. I hand you a file wrapper of the patent in suit, of which an affidavit of yours forms a part, and ask you to examine this affidavit and see if you recognize it?

A. It is my signature.

X70. Q. In this affidavit it states, "On or about April 7, 1920, Morris L. Weiss, the above named ap-

plicant, called at my office, No. 30 Church Street, New York City, and explained to myself and Henry S. Doty the invention set forth in said application. At said time this said Weiss delivered to said Doty and myself a sample of diphenylguanidine and explained to me and said Doty the manner and method of using the same as an accelerator in the vulcanization of rubber articles. Thereupon, said Doty agreed to make tests of said sample in the vulcanization of rubber, and on or about April 8, 1920, said tests were conducted by said Doty, at the Laboratories of the States Metals Company, Long Island City, New York. Immediately thereafter I was advised by said Doty that said tests had proved entirely satisfactory and the results obtained therefrom, using the same as an accelerator in the vulcanization of rubber, were superior to the results obtained when using hexamethylenetetramine. In view of the results of said tests, said Weiss, Doty and the deponent agreed to cooperate in the manufacture and sale of diphenylguanidine as an accelerator. Do you now say that when Mr. Weiss called to see you and handed you the sample of D. P. G. that he did not disclose to you that it was diphenylguanidine?

A. At the time he gave us the sample he did not disclose it.

X71. Q. Then when you say that he explained the invention to you, you mean that he gave you a sample and didn't tell you what it was?

A. Gave us a sample, which he said was an accelerator for the vulcanization of rubber, that he had tested it out, and was familiar with the properties of the rubber that could be produced by it, its physical

effects on that rubber, and that the only way for us to prove it to ourselves was to try it out ourselves. But he did not say the specific name of the chemical.

(Recess).

AFTERNOON SESSION.

Friday, October 9, 1925.

VAN LEAR WOODWARD resumes the stand.

CROSS-EXAMINATION (continued).

By Mr. Barrows:

X72. Q. Mr. Woodward, in order to avoid any ambiguity, I hand you copy of Weiss patent No. 1422506, granted July 11, 1922, assigned to Dovan Chemical Corporation, and ask you if that is the patent under which the Dovan Chemical Corporation began the manufacture of D. P. G.?

A. We only have one patent on the process of D. P. G., so that must be it.

X73. Q. This process was disclosed to you at the time or shortly after the time when you first met Mr. Weiss in 1920, and at or before the time you made your first agreement with him?

A. No, it was not.

X74. Q. This process was not?

A. No.

X75. Q. When was it disclosed to you?

A. After we had made the agreement.

X76. Q. Mr. Weiss had told you before that that he had a process for making it commercially?

A. For making the substance that he offered us commercially, yes.

X77. Q. Now, when you began making it you sold it through agents?

A. That is right.

X78. Q. And you gave to the purchasers the right or license to use it for vulcanizing rubber?

A. That is what we sold it for.

X79. Q. Now, when you first put it on the market you concealed its chemical identity?

A. You might call it that.

X80. Q. And sold it as a secret compound?

A. Sold it as X. L. O.

X81. Q. But the people to whom you sold it were not told what it was?

A. No, they were not.

X82. Q. Were you trying to keep that secret at that time?

A. To some extent.

X83. Q. As much as you could?

A. Until they asked specifically what it was, and then we told them.

X84. Q. When you sent out your circulars in 1920, and your first samples of X. L. O., what instructions did you give the rubber companies as to how to use it—anything beyond what was in your circulars?

A. Yes, we told them to use it in varying percentages on the rubber, depending on the type of product they were to make; they would range anywhere from a half per cent to four per cent.

X85. Q. And then you expected them to make the regular routine laboratory tests, to see what par-

ticular amount was required and what condition of cure for any particular compound they were interested in?

A. So far as possible, we asked them to give us details as to the compound they wanted to use it in, and we would have our own laboratory work out the proper proportion—what we thought was the proper proportion, and submit that report to them.

X86. Q. And the work you would do in your laboratory was the ordinary routine testing for accelerators of that particular compound?

A. Determining the correct amount of accelerator for that compound.

X87. Q. At the time of the Aniline trial, I believe you or Mr. Doty said that the sole business of the plaintiff at that time was the manufacture of D. P. G. That is correct, is it not?

A. That is correct.

X88. Q. Is that still so?

A. Including in that to cover di-substituted guanidines now, because we are selling limited quantities of another di-substituted guanidine.

X89. Q. That is, since the first trial and the present trial you have added another accelerator to the business of the company?

A. Yes.

X90. Q. And the sole business of the company at the present time is making these two accelerators?

A. That is right.

COLBY DILL, a witness produced on behalf of the plaintiff, having been duly sworn, testified as follows:

DIRECT EXAMINATION.

By Mr. Wooster:

1. Q. What is your name, age, residence and occupation?

A. I have just given my name; my age is forty-two; I live in Woodbridge, N. J.; my occupation is director and acting superintendent of the Roessler and Haslacher Chemical Company, and I have some other positions with other companies that are affiliated with that company.

2. Q. How long have you been connected with the Roessler and Haslacher Chemical Company?

A. Since January, 1908.

3. Q. During your connection with this company has it manufactured and sold accelerators for the rubber trade?

A. Yes.

4. Q. Will you give the names of some of them, with the approximate years when they were put on the market?

A. Hexamethylenetetramine we have been manufacturing and selling for about twenty years. We first sold it as an accelerator about ten years ago. We also sold, beginning about that time, thiocarbanilid, anilin oil, and subsequently aldehyde ammonia, D. P. G., and three or four others.

5. Q. When did you commence to market D. P. G.?

A. I think we took the first order in the spring of 1922.

6. Q. Have you since marketed it in quantity?

A. Yes.

7. Q. What led your company to market D. P. G.?

A. Because our salesmen reported to us that our customers wanted it.

8. Q. Are you familiar with patent to Weiss No. 1411231, here in suit?

A. Yes.

9. Q. Were you notified not to infringe this patent, shortly after it was issued?

A. Yes.

10. Q. What did you do about it?

A. Why, I either called up or wrote a letter to the Dovan Chemical Corporation and had a meeting with them.

11. Q. What was the result?

A. The eventual result was that we entered into an agreement with them.

By Mr. Edmonds:

I object to any oral testimony from this witness about any license agreement between these two companies, if that is what he is to be questioned about. His oral statement would obviously not be the best evidence, and that is a matter on which primary evidence only is admissible.

By the Court:

The answer is probably preliminary to something that is of importance in itself, as I see it. We will not strike out the testimony at this time.

12. Q. Have you a copy of that agreement with you?

A. There is one in the room here. I might say I am willing to produce this license agreement, but there are some matters in it which I am not sure my company would like to have made a matter of public record.

By Mr. Wooster:

I suggest we have the agreement produced for the inspection of the Court and counsel, and agree as to parts of it to be used.

By the Court:

What do you expect to prove?

By Mr. Wooster:

Acquiescence in this patent by this company.

By the Court:

Not a party to the suit?

By Mr. Wooster:

Not a party to the suit. A very important part of the case.

By Mr. Edmonds:

All of this, I maintain, is irrelevant.

A. I think that is the copy there (indicating document).

13. Q. What is the date of this agreement?

A. July 8, 1922.

14. Q. Under this agreement has your company paid royalties or other consideration to Dovan Chemical Corporation?

By Mr. Edmonds:

Is this agreement going to be offered in evidence?—Before the witness answers, may I ask if this agreement is to be offered in evidence?

By Mr. Wooster:

I would like to make the same stipulation that we did about the Weiss employment contract —that certain parts of it may be used, if you will agree.

By Mr. Edmonds:

I probably will agree to eliminate any parts that you do not want to have made public, but I want to see for myself, to see if I do agree to that. I haven't any desire to expose the private affairs of any of these companies, but I want to know what is in this agreement.

15. Q. (Question read).

A. Yes. I might explain at this point that that agreement is between the Dovan Chemical Corporation and the Perth Amboy Chemical Works, which is a subsidiary of the Roessler and Haslacher Chemical Company, that I first mentioned.

16. Q. And has not the Perth Amboy Chemical Works, since the date of this agreement, been absorbed into the Roessler & Haslacher Chemical Company?

A. Yes, sir.

17. Q. And the Roessler & Haslacher Chemical Company is the successor of Perth Amboy Chemical Works?

A. Well, that is substantially the situation. I

am not an attorney and I don't know whether that is the proper form to apply.

18. Q. Well, it took over its business and assets and good will?

A. Yes.

19. Q. State the approximate amount of money paid by your company under this agreement to Dovan Chemical Corporation?

A. It was over $90,000.

CROSS-EXAMINATION

By Mr. Edmonds:

X20. Q. Has your company paid license fees under this patent since the summer of 1923?

A. We have paid no license fees since the time when the last suit was definitely settled—definitely decided.

X21. Q. That is, since the Circuit Court of Appeals of New York—the Circuit Court of Appeals of the Second Circuit held the patent to be invalid, you have paid nothing?

A. No.

X22. Q. My statement is correct,—you have not paid anything?

A. Well, I understand your statement was substantially the same as mine.

X23. Q. That is what I wanted to make sure of, that you said the same thing.

A. After it was definitely decided in that litigation that the patent was invalid in the jurisdiction of that court, then we were through as far as paying any royalties under that license, until it is re-established again.

X24. Q. And you have paid nothing since?

A. We have paid nothing since.

X25. Q. Does this paper here express the whole of the agreement between R. & H. and all of its subsidiaries, on one hand, and this Dovan Company on the other?

A. That agreement, I think, refers to—Now, wait a minute. I would like to glance that contract over, if you please. (Contract handed to witness). Mr. Edmonds, at the time this contract was signed, our people agreed with Dovan that we would consent to the issuance of a license to Dovan by the Graselli Chemical Corporation, under a certain patent. We had the right at that time to say whether any more licenses should be issued, or not, and we gave our consent to the issuance of such a license. I think that is the only thing that you could say that was connected in any way with this agreement that does not appear in it.

X26. Q. Was that the subject of some other writing?

A. Well, it is in this sense,—that an agreement was executed between Dovan and Graselli, and we indicated in writing, either on that agreement or on a letter which accompanied that, that we gave our consent to it.

X27. Q. Did you have a written license from the Graselli Company under this other patent?

A. Yes.

X28. Q. And did that say that you were the exclusive licensee?

By Mr. Wooster:

I object to that, as outside the direct, and involving relations between the Roessler & Haslacher Chemical Company, or its subsidiary Perth Amboy Chemical Works, and Graselli Chemical Company which are entirely outside the issues of this case.

A. If I can answer your question in this way,—that under the terms of that license agreement Graselli would not have the right to issue a license to the Dovan Chemical Corporation unless we gave our consent.

X29. Q. That, I take it, means the same thing I said,—that you were the exclusive licensee.

A. No, it doesn't mean quite the same thing.

X30. Q. And the only thing supplemental to this is that at that same time you consented that the Dovan Company might be licensed under this other patent, owned by the Graselli Company.

A. Yes, that is the only other thing that I recall.

By Mr. Edmonds:

Well, I think this whole transaction should be made a matter of record, and therefore I call on the plaintiff to produce this license of the Dovan Company under this other patent, for inspection of counsel. If that is a thing that you do not care to have made public, I will agree to leave out any parts that you think you would like to have suppressed. I haven't anything further from this witness.

By the Court:

The purpose of this is just simply to show acquiescence by other companies in this patent?

By Mr. Edmonds:

Less than that, Your Honor. It is an acquiescence which occurred two or three years ago and stopped in the summer of 1923.

By the Court:

Well, I don't know that we are interested particularly, are we, in the absolute details of that.

By Mr. Edmonds:

I think it is a very trivial matter, but if part of it comes out, I think the whole thing ought to be on the record. I don't see that any of it was needed at all.

By the Court:

I can conceive it might be an element to show there had been a qualification in the acquiescence of the patent, and in that event it might possibly be admissible in evidence along a certain line, although, in the ordinary case, the fact that parties outside of the record had taken any particular attitude in the matter would be entirely irrelevant in a dispute between two parties.

By Mr. Kennedy:

That is true. But it is not applicable in a patent case. Patents are addressed, not to a court, or to lawyers, or to patent lawyers, but to those skilled in the art to which the patent per-

tains, and if one in that art takes a license under that patent to manufacture and sell, or use, and pays tribute, he recognizes the patent as a valid patent from his point of view.

By the Court:

I think that is probably true in regard to this, and I am inclined to admit testimony to that effect; but I don't see—and I am addressing myself to counsel on the other side and his objection to it—that we are especially concerned, or that we ought to encumber the record with anything else than the mere essential fact there, unless there is dispute of the fact, and it is alleged that the contract was something else than that general acceptance. If it were qualified in any way, or the agreement were something else, then I could conceive that that agreement ought to be offered in evidence; otherwise its only purpose—it would only serve to encumber the record. I think upon demand counsel is entitled to inspection of the agreement.

By Mr. Edmonds:

That is all I ask, and if on inspection I find it will not add anything, I certainly will not offer it. But when they bring in this transaction, I think I should be permitted to know what the whole transaction is, instead of just a part of it. I don't understand that any objection has been presented to my request—is there?

By Mr. Wooster:

Yes, I object to it.

By the Court:

If you offer testimony of the existence of an agreement, you are subject to all the demands which would naturally fall upon you, and part of it would be the production of the agreement, for the purpose of finding out. You are testifying here as to a conclusion. If there is no dispute as to the conclusion, the record ought to be allowed to go, as a matter of common sense, with that, as sufficient; but if there is any question as to the correctness of the conclusion, that must be determined by the production of the agreement.

By Mr. Wooster:

This agreement that is here produced between Perth Amboy and Dovan Chemical Corporation expresses the entire agreement between those two companies as to this patent in suit. The agreement now called for by Mr. Edmonds is an agreement between the Perth Amboy Chemical Works, the Dovan Chemical Corporation and the Graselli Chemical Company of Cleveland, respecting an earlier patent, owned by the Graselli Company.

By the Court:

But your inquiry related simply to the agreement between the Dovan Chemical Company and the company first mentioned?

By Mr. Wooster:

It did.

By the Court:

Well, I think your attitude is right then.

By Mr. Edmonds:

The answer to that is that this paper does not express the whole agreement that this Perth Amboy Chemical Works entered into. In addition to that, there is consent to the execution of another paper, which really amounts to giving up some right that they then had. They had the right of precluding the Graselli Company from licensing anybody, and they gave up that right to the extent of allowing the Graselli Company to license.

By the Witness:

It was a three-party agreement, Mr. Edmonds.

By Mr. Edmonds:

The Graselli Company,—your company, and the Dovan Company.

By the Witness:

Yes.

By Mr. Edmonds:

That is the paper I wish to see, as completing the transaction referred to here.

By the Court:

The effect of that is what, you claim—as modifying the recognition of this contract by the Perth Amboy Company?

By Mr. Edmonds:

Not knowing what it is, I can't very well characterize it, but it may be that this whole transaction is a fictitious one, and that the na-

ture of it would appear on examination of that document.

By the Court:

Well, I think that so far as examination of the agreement is concerned, you should be entitled to that in connection with the cross examination.

By Mr. Wooster:

It is not here. We can bring it next week. It is admitted to Your Honor—and I think you will agree that it is irrelevant here, and that if it has any effect at all it simply shows that Perth Amboy Company, in addition to paying money to the plaintiff here under the patent, paid a further consideration in permitting the Graselli Company to license Dovan.

By the Court:

Well, I think that would be immaterial, unless it were along that particular line, as possibly modifying the recognition, and showing that they had perhaps some other, in which event that might be shown, as affecting the main proposition of recognition. You may produce it next week, and in the meantime we will allow you, in case it is necessary, to reopen the case and recall the witness.

By Mr. Edmonds:

X31. Q. This license agreement that you have produced is a license not only under this patent in suit, which has been held to be invalid, but also is

under another Weiss patent relating to a process of manufacture of this substance known as D. P. G.?

A. That is correct.

X32. Q. And you operated under that other Weiss patent on that process of making D. P. G.?

A. Yes, we did at one time.

X33. You don't any more?—Well, if you would rather not state, I will not press that question. Now, it was represented to you that this other patent covered a process whereby this substance could be manufactured at a very low cost, and that is one of the reasons why you entered into this agreement, isn't it? Perhaps you may want to read the paragraph—

A. I recall the matter that you refer to. The cost that the Dovan people told us they could realize was stated in the contract. Whether those are very low or otherwise is a matter of opinion.

X34. Q. And furthermore you were licensed under certain Canadian patents by this same agreement?

A. Yes.

RE-DIRECT EXAMINATION.

By Mr. Wooster:

35. Q. In the event that Weiss patent, 1,411,231 in suit is upheld in litigation other than that in New York against the National Company, is your company obligated to resume payment of royalties for its sales of diphenylguanidine and disubstituted guandines, as accelerators for the vulcanization of rubber?

By Mr. Edmonds:

Is that covered by some statement in this paper?

By Mr. Wooster:

I am asking him the fact.

A. If the patent is re-established, yes.

By Mr. Edmonds:

36. Q. Is that covered by some provision in this document?

A. That is covered by an agreement that was executed after that.

37. Q. Oh, then there is some more to this agreement. You only mentioned one thing—

A. Well, Mr. Edmonds, that patent was superseded—

By Mr. Wooster:

That agreement.

A. —that agreement was superseded after the National decision a year or two ago by another agreement.

By Mr. Edmonds:

Well, then, I will call on my adversary to produce that agreement also.

By Mr. Wooster:

That is here and is produced.

38. Q. Now, in these two documents, and this three-party agreement that you have referred to, will we have the whole transaction?

A. I think so.

By Mr. Wooster:

I offer in evidence as Plaintiff's Exhibit No. 10, pages 2000 to 2074, inclusive, of the 2000 X-book.

It is stipulated that in lieu of the original book—which will remain here during the trial and argument, and be subject to production upon request, so far as plaintiff can thereafter obtain it from Republic Rubber Company, or Lee Tire & Rubber Company—photostatic copies of these pages may be substituted and used with the same force and effect.

By Mr. Edmonds:

It will certainly be produced in the Court of Appeals if this case ever gets there.

By Mr. Wooster:

If we can get it. I also offer page 1764 (previously marked Plaintiff's Exhibit No. 7); also page 1773 (previously marked Plaintiff's Exhibit No. 8); I also offer page 1777 (previously marked Plaintiff's Exhibit No. 9). The same stipulation is made as to production of this 1700 X-book and use of photostatic copies of these pages, as was made in the case of the 2000 X-book.

By Mr.Wooster:

I am reliably informed that since the service of process in this case on defendant, Corona Cord Tire Company, Messrs. E. I. du Pont de Nemours Company, of Wilmington, Delaware, have assumed the control and expense of the defense of this suit, and I request Mr. Edmonds to so state.

By Mr. Edmonds:

Mr. Edmonds refuses to make any such statement.

By Mr. Kennedy:

If your Honor please, if there is a party—an actual party and not a nominal party here in court in the defense of this suit, he is in the attitude of submitting himself to the jurisdiction of the court, as the courts have repeatedly held. If, therefore, the Du Pont Company has assumed control of the conduct and expense of the defense of this suit, the plaintiff is entitled to know it, because if it has, then it is estopped by any decree, if there be such, that may be entered in this suit for plaintiff and against defendant. On the other hand, if the decree should be otherwise, it would not be estopped but would have the benefit of it. Now, if counsel for defendant knows that the Du Pont Company is in the attitude stated by my associate, Mr. Wooster, as an officer of the Court he should say so.

By Mr. Edmonds:

It strikes me as being an absurd proposition, that this plaintiff—when it decided to bring suit, it could have brought suit against the Du Pont Company, or anybody they pleased, who they thought were infringing, and they chose this Corona Company, and we are here defending as to whether this Corona Company infringed this patent. That is the only issue before this court, and as to who may be aiding the Corona Company, or whether anybody is aiding it, has no more

bearing on the question of the validity of this patent than anything else one might imagine.

By the Court:

Yes, that is confirming my impression, that you cannot bind the other company. I will give the matter some consideration between now and next week, although I am free to say my present impression is very strong along that line, that you certainly cannot bind a party not intervening and not a party to the suit by any such loose method as that.

By Mr. Wooster:

I am prepared to call Mr. Doty and offer prima facie proof of that.

By the Court:

Well, you haven't them in court.

By Mr. Wooster:

Who—the Du Pont Company?

By the Court:

Yes. Unless they come in and formally intervene—if their counsel does not formally make such statement as that, and ask for leave to intervene, my impression is very strong that you could not do it. But as I say, I shall give the matter some consideration. I never heard of any such method of joining a party.

By Mr. Wooster:

Your Honor will appreciate from my statement that we filed this bill in good faith against the Corona Cord Tire Company, and thereafter,

I said, this Du Pont Company has taken control of the case. Now, I offer prima facie proof of that, if counsel will not admit it.

By Mr. Edmonds:

I certainly would object to any such proof of that, just as I would to all other irrelevant proof.

By the Court:

You may make your offer at this time.

HENRY S. DOTY, a witness produced on behalf of plaintiff, having been duly sworn, testifies as follows:

DIRECT EXAMINATION.

By Mr. Wooster:

1. Q. What is your name, age, residence and occupation?

A. My name is Henry S. Doty; age, forty-one; residence, Passaic, New Jersey; occupation, president of the Dovan Chemical Corporation.

2. Q. Did you attend sessions of rebuttal testimony for Scott, in the interference of Scott vs. Weiss vs. Huser, which were referred to here yesterday?

A. Yes.

3. Q. Where was that?

A. The sessions were held in Boston and New York.

4. Q. I asked you about the rebuttal testimony for Scott. Where did you attend that?

A. In New York City.

5. Q. Where, whose office?

A. At the office of Prindle, Wright, Neal & Beam.

6. Q. Do you know James W. Kinsman?

A. Yes.

7. Q. Was he at any of these sessions?

A. Yes, he was at most of them.

8. Q. By what company is he employed?

A. The E. I. du Pont de Nemours Company.

9. Q. In what position?

A. I believe he is manager of the Intermediates Department.

10. Q. How long have you known Mr. Kinsman?

A. About a year.

11. Q. Did you and Mr. Kinsman have a conversation respecting this case here of Dovan vs. Corona Cord Tire Company?

A. Yes, we frequently mentioned it.

12. Q. When?

A. At these various meetings.

13. Q. What was said?

By Mr. Edmonds:

No, no—No general question, letting the witness answer anything he pleases. I think the questions must be made definite. We might just as well get to the issue at once. Why not ask him if Kinsman told him that du Pont was interested in this suit?

14. Q. Did you have any conversation with Mr. Kinsman as to who was controlling and defending this suit and paying the expenses of it?

A. Yes.

By Mr. Edmonds:

I object to this question, because it is irrelevant and immaterial, in that it has no bearing on the single issue before this court, which is whether or not a certain patent is a valid patent; and even if the subject matter words are named, it could not be proven in any such way as this.

By the Court:

I doubt if the agency even has been established. I will for the present sustain the objection.

Exception noted to plaintiff.

By Mr. Wooster:

I expected to prove by this witness that Mr. Kinsman definitely stated, without qualification of any kind, that the du Pont Company was controlling the defense of this case, and further expected to prove that Mr. Kinsman was authorized to make such statement, by reason of his responsible position with the du Pont Company, and that he had actual knowledge of that fact. This statement is made to preserve my exception.

By Mr. Edmonds:

In view of that statement, I would like to say that if these expectations were realized, I would prove that Mr. Kinsman was not authorized to make any such statement.

By the Court:

I will sustain the objection.

By Mr. Wooster:

Subject to the objections and exceptions taken as to further proof by plaintiff, prima facie proofs are closed.

(PLAINTIFF RESTS).

DEFENDANT'S CASE.

By Mr. Edmonds:

As stated by Mr. Kennedy, the patent involved in this suit has been in litigation heretofore, in the Second Circuit, and has been found to be a valid patent. The suggestion that four Circuit Judges passed on that patent and were equally divided numerically, is true in a very superficial respect. The opinion of Judge Manton, which doubtless will be submitted here, involves errors of fact and errors of deduction from facts, and in the opinion in the Circuit Court of Appeals, of Judges Hough and Rodgers, there is an accurate statement of these facts, at the bottom of which is a notation that Judge Mayer dissents. There is no suggestion anywhere that Judge Mayer concurred in anything that appears in Judge Manton's opinion, so that the idea that two judges concurred in some view favorable to the patent, and two were opposed to it, is quite wide of the fact. Unless your Honor has seen the opinion of the Circuit Court of Appeals, perhaps you would care to have me pass those up. It is reported in 292 Fed. Rep. As I stated, the opinion of the District Court is not reported.

The patent involved in this suit relates to accelerators in the process of vulcanizing rubber. This process of vulcanization used in practically all rubber articles, is a process of uniting sulphur with the rubber to improve the physical properties of rubber, and make it harder or more elastic or stronger, or whatever particular physical properties are desired. Those properties are arrived at by vulcanization, and that has always been the process of vulcanization throughout the eighty years that has been employed. For many years past, much more than Mr. Kennedy suggested, probably for all of eighty years of vulcanization, accelerators have been used to hasten the process of vulcanization. At first, the substances used were what chemists knew as inorganic substances. In more recent times, organic substances were found to be better, and they have been used over more than ten years back, and chemists have steadily investigated to produce better and better. The patent in suit purports to disclose a particular one, which is stated to be better than any others. There is in this patent one single idea, and nothing else, namely, that one particular substance that is named there is a very active accelerator, a more potent accelerator, than substances that had been known before. That is the sole idea of this patent as involving any novelty. The claim is that this man found that this one substance is a more active accelerator, and when one has said that, he has stated all that is suggested in this patent as involving any novelty. That substance is this one named

diphenylguanidine, a substance that has been known in chemistry for generations back, is listed in chemical literature, its formula given, and all that sort of thing, but no utility in the industrial world for that substance had been known, and the claim of this patent is that this patentee had found that particular substance, known for generations, but not known to have a special utility, is a powerful thing in accelerating the vulcanization of rubber. That is what this patent purports to cover. At this point I would like to say that Your Honor may feel, unless you have had occasion to study the chemical sciences, that this suit is going to present several difficulties from a scientific standpoint. I think that is not so. I say that from my own experience. The properties of chemistry involved are simple to a degree, and will require nothing more than acceptance of the statement that certain substances will accelerate vulcanization. Why they do it, and how they do it, Your Honor need not know for the purposes of this case, and it is well that we need not. The leaders of thought in the chemistry of rubber are much disagreed as to that, even to the present day, and they have been trying to come to some decision as to how these chemicals act. For our purposes, all we need to know is that if you put a certain quantity of one of these substances into the rubber batch, acceleration will occur.

Now, if I have pointed out to Your Honor exactly what it is that this patent purports to disclose to the world, as to the item of novelty, I

want to proceed to the defenses which we shall undertake to present.

First of all, there is this very remarkable circumstance, at a time more than two years before the application for this patent was filed in the Patent Office, a man of recognized standing in the rubber industry, known far and wide as one of the leaders of thought in the chemistry of rubber, addressed a meeting of representative rubber chemists of the country, at a meeting of the American Chemical Society in Philadelphia, and in the course of his address he disclosed to these chemists assembled there the very thing that this patent purports to cover, and more than two years before the patent was even applied for. He did it orally, standing up before a meeting of these chemists. For that reason, that disclosure, made more than two years before the application for patent was filed, is said by the plaintiff not to be a statutory bar to the validity of this patent, because the statute says that only a disclosure in a printed publication will suffice as a statutory bar. The fact of the matter is, that this paper read there by Dr. Kratz was not in print, and was not circulated among these men until a few months later, within the period of two years before the application for the patent was filed.

Now, there is this further most unusual circumstance, to which I think great weight must be given, and which we should certainly establish here, namely, that when this Dr. Kratz made this disclosure to this meeting of chemists in 1919, more than two years before the application was

filed, what he said and what he imparted to these assembled chemists by reading that paper, and also by putting certain tables on a blackboard, was within a very few days of the application for the patent in suit, and he knew of that disclosure throughout this period of over two years, during which he deferred the filing of the application for this patent, and during which he deferred the assertion of any claim whatever to having originated this idea. More than that, we will show that during that period of two years, within which he made no claim whatever to having originated this idea, there were occasions when there was every reason in the world why he should have asserted that claim, and why he doubtless would have asserted it, if there had been any truth in it.

We shall show further that Dr. Kratz, who read this paper before the meeting I have referred to, not only conducted the laboratory investigations necessary to develop this information that he put into the paper, but also that he made use of that information in a shipment of automobile tire tubes that were made at his plant, and that those tubes which he made, and which had this substance in them, constituted a utilization of the invention at a time prior to any claim by the patentee, and that the patent is therefore invalid, by reason of what is known as a public use.

So with respect to this work of Dr. Kratz's, we say that the patent in suit is invalid, because of prior knowledge by Dr. Kratz, long prior to anything claimed by the patentee, and acknowl-

edged by those who operated with him in the laboratory where he was working; second, that it is invalid because of the manufacture and sale of these tubes that I referred to, having the substance in them, and of course prior invention by Dr. Kratz, because if there is any invention in this substitute at all, it was made by Dr. Kratz before it was made by Weiss.

Those are three defenses that we shall present. Also, I shall continue to assert, as I always have asserted, that even if this idea had originated with this man Weiss, and no one ever set up an adverse claim, still the thing does not involve invention. The patent should be held to be invalid, as not covering an inventive idea. This patent, I say, is granted for a thing that should have been obvious to any man skilled in the art, to such an extent that the patent should be held invalid for that reason.

To elaborate that just to a small extent, I might say that in the very factory were this man Weiss was working, they were making use of a substance known as triphenylguanidine, which is as closely related to this diphenylguanidine as the names would seem to indicate. In the dictionary, the two come immediately one after the other. Anybody working with triphenylguanidine and having any occasion to look into a dictionary, as the chemists in the plant doubtless would, would have found on the next line this substance diphenylguanidine, and all he had to do was to try it. That is the only way any accelerator is ever found, because there is no way of foretelling what

will be an accelerator. No one knows just why it accelerates and how it acts. Moreover, the literature of the rubber art had contained references to the guanidines as possible accelerators, and that suggestion of the guanidines as a class, coupled with the actual use of triphenylguanidine, seems to me to make the mere act of taking the next thing in the dictionary, and trying that and finding that that is an accelerator also, just what one would expect it to be who knew that triphenylguanidine was an accelerator. That is not an inventive act.

Such a patent is what Judge Hough referred to in that decision as a patent of observation. He did not say that the patent was invalid because it did not cover invention. The Court of Appeals held the patent invalid, because of this work of Dr. Kratz. They said the idea was disclosed in a book, in Dr. Kratz's paper, and that the plaintiff had failed to prove the date of the invention of Weiss earlier than that publication. They said further that even if you grant all that the plaintiff offered by way of proving the date of invention of Weiss prior to this paper, then by the same token you must look into Kratz's work, and you will find that at every step of the way Kratz was ahead of Weiss, ahead as much and more than Weiss.

It was on that ground that the patent was held to be invalid by the Court of Appeals, and the Court did comment on this other defense which is present; that is, that the act said to be an invention was not an inventive act at all, and

in commenting on it, Judge Hough dubbed the patent a patent of observation, a patent granted to a man for observation of a thing that anybody might have observed, and that the suggestion looked for was contained in what the art had known before.

In addition to that, there is one further defense which we shall present, and that is that this idea, this one idea of the Weiss patent, did not originate with Weiss. There is a peculiar situation in that connection which can hardly be outlined briefly, but as briefly as I may state it, I will say that in the Weiss effort to establish that he conceived this idea before this Kratz paper, it became necessary for him to present the records of the laboratory where he worked in 1918 and 1919—this Kratz paper was in September, 1919—and he presented this laboratory book of the Republic Rubber Company, and referred to certain experiments recorded therein, and that book discloses that Weiss's predecessor in that laboratory had experimented with diphenylguanidine, one of his experiments recorded there, and curiously enough, on the same page Weiss came along some eight or ten months later and recorded another experiment right there. So that the suggestion of this was not an original suggestion of his. It was a suggestion made to him by this record of his predecessor's work. He of course denies that he saw that, and he said he had no recollection of it. Once or twice I think he said he didn't see it, and at another

time said it was not there. I think he said various things about it.

We will maintain that that record was there all the time that Weiss was working in that laboratory, recording experiments in that book, and the suggestion of the one item of novelty that appears in this patent came from the records that he saw there, not as an original suggestion of his own.

Those are our defenses as to all the claims of this patent, but I wish to say further that there is one group of claims which the plaintiff asserts has a wider application than merely to this one substance, diphenylguanidine. In those particular claims, they attempt to employ a broader definition, by characterizing the achievement of one involving the use of disubstituted guanidines, which they say is this diphenylguanidine and various others. As to those particular claims, there are additional defenses applicable only to them. One of them is that there is a magazine article published more than two years before the application for the patent was filed, which discloses a disubstituted guanidine usable as an accelerator. That is not diphenylguanidine, and therefore that publication would not be a bar to the validity of these more narrowly related claims; but as to these broader ones, that publication alone, we say, is a complete bar to the validity of those claims. This is a matter which was presented in the Aniline suit, which was not referred to by the Court of Appeals, because all the claims were held to be invalid.

One other defense applicable only to these broader claims is that they are improper claims, for the reason that they attempt to cover many things other than those that this patentee had any knowledge of, and by doing so, they make the invention broad enough to cover substances that would not be accelerators at all, and the claim is necessarily bad, for the reason that attempted broadening of the definition was carried so far as to include things that are not accelerators at all, and the claim is bad for that reason.

I think that that covers the defenses on which we rely.

Perhaps it would be well for me to speak briefly of one other subject. The proceedings in the Patent Office that led up to the granting of this patent are rather important, and we think they are of outstanding importance. As I said, this patentee claims to have made this invention in the early part of 1919, but his application for the patent in suit was never filed. He never applied to the Patent Office for a patent until November, 1921. He waited over three and a half years. Now, when he did apply, the Patent Office Examiner made the usual search among disclosures of accelerators, to see if its application presented anything new, and he found a magazine article written by Scott and Bedford, two well-known rubber chemists, in which they referred to this substance, diphenylguanidine, as an accelerator. Now, that would have been a valid basis for rejecting this application, but for the fact that the date of that publication of Scott

and Bedford was some time in 1920, and Weiss made the claim that he had made the invention before that publication. Now, in accordance with Patent Office procedure, that claim of an early date, to overcome a rejection of that sort, must be made by affidavit setting forth the actual date of invention. So Weiss, with some of his associates, submitted an affidavit in reply to that rejection, in which they attempted to recite the facts that would justify them, and assuming that he made the invention prior to the Scott and Bedford paper. Those affidavits were submitted, and the Patent Office Examiner withdrew his rejection and allowed the application.

Now, before the patent was issued on the application, this paper of Dr. Kratz came to the attention of the Examiner. As I said, it was delivered orally, more than two years before the application for the patent was filed, but the paper appeared in print some six months later. One of the magazines printed it in full in April of 1920, which you see is a year and a half before the application for the patent was filed. Now, the paper came to the Examiner's attention, the attention of the Patent Office examiner passing on this Weiss application, and he recognized at once that in this Kratz paper was the statement that this diphenylguanidine was an active accelerator, much more active than triphenylguanidine, and various others; in fact, the paper goes so far as to give the parts representing the exact ratios of activity of these substances. And the examiner then applied to the Commissioner

to have that application that he had allowed, sent back to him, and when he got it sent back to him he rejected the claims again. In view of this Kratz publication, to which he referred as having been printed in this magazine of April or March of 1920, and he said "This purports to be a paper delivered orally in September, 1919. So that is the effective date." Now, in answer to that rejection, Weiss and his cohorts came back with another series of affidavits, in which they attempted to establish that the invention was conceived and developed, etc., by Weiss at a time prior to September, 1919, considerably more than two years before his application for patent was filed. Now, as your Honor will appreciate, the Patent Office has no machinery to examine into the facts submitted by affidavit, so that when this affidavit seemed superficially to establish a sufficient early date there is nothing that the Patent Office can do but accept them and allow the application and issue the patent, and that is what this examiner did. Those affidavits we shall have considerable occasion to refer to because, in our estimation, it appears now in the light of facts that have subsequently come out, that they were gross misrepresentations and that the patent was issued on the basis of such misrepresentations. I think this is enough to inform your Honor as to how the patent came to be issued by the Patent Office, in view of these prior publications of the greater activity of diphenylguanidine.

I wish to say further that this story of Weiss

that he made this invention away back three or four years prior to the filing of his application, has now been told I think five times; first, in the first series of affidavits, and second, in the second affidavits, filed in the Patent Office, and third in the suit that was tried in New York, where Weiss took the stand; and fourth, in the course of the interference proceeding involving another application for patent filed by Weiss on a somewhat different subject. Those four times, and I suppose we have to hear it again.

One further thing that I should mention, to cover the subject and all its elements, is this: As I said at the outset, this substance, diphenylguanidine, has been known for generations. It appears in the chemical text books, and directions for making it are readily available, but there not being a known use for it. There had been enough in chemical rubber developed for the manufacture of it, so that if in 1917 or 1918 some one had wanted to sell diphenylguanidine and had looked it up in the dictionaries that the literature afforded, he would have found that the cost of producing it by that laboratory method would be considerably in excess of the price which rubber companies would pay for accelerators. So in order for that substance to be used as an accelerator, it must be very obvious that two things were essential; first, that the utility of the substance must be appreciated, and second, that the substance must be manufactured at a cost that is within the reach of commercial possibilities, a

price that the rubber manufacturing companies will pay.

In addition to the patent involved in this suit, Weiss has taken out another patent, which covers a process of making diphenylguanidine. That process, and nothing else, a series of steps involving chemical reactions, etc., that must be taken to produce the substance, and in that patent he says "Prior to my invention, this substance has been known but there has been no known method of making it at a low price, and my object is, as disclosed in this patent, to develop a process whereby this material can be made cheaply". Now, it may be that he did devise a process, and it may be that process itself involved invention, and he certainly has a patent on it. That is an unquestionable fact. But I mention this because I hope it will be possible to keep these two patents entirely distinct and separate in the course of this suit. They are two wholly different things, for two different ideas, put forward by Weiss as being two different ideas, susceptible of being patented separately, and recognized by the Patent Office as two separate and distinct achievements, and I say that because one of the most serious errors that Judge Manton made was to consider these two patents together, as though they were one only, and covered one achievement, and he thought that Weiss must have done something, so he sustained the patent covering the use of diphenylguanidine itself, on the basis of some achievement in devising a process for making it. That probably was due to the persistent

reiteration of counsel who then represented this plaintiff, who said an innumerable number of times that it was Weiss who made this substance available to the public. Suppose he did devise a process for making it at a low price? That has nothing to do with the disclosure of a single item of information that this substance is an accelerator.

DEFENDANT'S TESTIMONY.

By Mr. Edmonds:

There are some formalities for the defendant that probably should be taken care of at this time, but as there are two or three witnesses that we would like very much to examine today, so that they might go home, I would like to proceed with them at once, and if I may waive these formalities for the present, I would like to call Dr. Amend.

OTTO PAUL AMEND, a witness produced on behalf of the defendant, having been duly sworn, testified as follows:

DIRECT EXAMINATION.

By Mr. Barrows:

1. Q. What is your occupation, doctor?

A. I am president of Eimer & Amend.

2. Q. What is the business of Eimer & Amend?

A. The business of wholesale drugs, chemicals and chemical apparatus.

3. Q. Located where?

A. Located 18th and 19th Streets, and 3rd Avenue, New York.

4. Q. How long have you been associated with Eimer & Amend?

A. Since the fall of 1880.

5. Q. And what has been the business of Eimer & Amend since 1880?

A. Supplying schools, colleges, the various U. S. institutions in Washington, with chemicals and apparatus.

6. Q. How many chemicals does Eimer & Amend have in its list of chemicals that it supplies?

A. Well, I should judge about two thousand chemicals that could be called for every day—more or less ordinary chemicals.

7. Q. And what proportion of those are organic chemicals?

A. I should think about one to ten, that is, nine parts of inorganic to one part of organic.

8. Q. And how many organic compounds would you say you have in stock?

A. Well, it is difficult to tell. I judge about five to six hundred of the more ordinary chemicals, organic.

9. Q. And in addition, others which are not ordinary?

A. Which are not ordinary.

10. Q. How many of those?

A. I don't know how many. We have quite a list.

11. Q. Do you recall whether, prior to the time this country became involved in the World War, you had any guanidine derivatives in stock?

A. We did have, yes.

12. Q. Do you recall what some of those were?

A. Well, we were not able to import the organic compounds from Europe when the war started on the other side, and it was early in 1917 that the head of the so-called Pure Chemical Department sent up the questionnaire, asking whether we could give them the phenylguanidine group. I asked what they wanted, and they said they would like to have mono—, di— and tri— phenylguanidine.

13. Q. Did you have those in stock at that time?

A. We had the di— and the triphenyl in stock, and we were running low; and consequently they asked whether we would be able to produce them in our laboratories.

14. Q. How long had you had those in stock?

A. The triphenyl I was told we had in stock since 1914; the diphenyl, as far as my recollection goes, we had in stock since '16.

15. Q. Do you recall whether you had requests for these guanidine derivatives?

A. We must have had requests, because they said the stock was running low, and they wanted to know whether we could make some of it.

16. Q. Have you any way of knowing from whom these requests came?

A. I don't know, no.

17. Q. How many requests for chemicals of this kind do you have in the course of your duty?

A. Practically every day something is asked for that is not in the market.

18. Q. How closely are you identified in the af-

fairs of your company with these requests for chemicals?

A. I go through the mail in the morning.

19. Q. How extensive is that mail?

A. The mail runs between twelve and sixteen hundred letters.

20. Q. A day?

A. I beg your pardon—A day. In the morning, the first mail.

21. Q. Do you recall whether the Republic Rubber Company is or has been a customer of Eimer & Amend?

A. They have been a customer, yes.

22. Q. For how long?

A. I don't know, but quite some time back.

23. Q. Many years.

A. Yes, quite a number of years.

24. Q. Have you looked for any correspondence or orders or other records that would identify any purchases by the Republic Rubber Company from you, in 1916 or 1917?

A. I tried to look up some of the books, sales, etc., and I was told we kept the books, sales, etc., not longer than six years, because they accumulated, and we sold them as old paper.

25. Q. You mean, you haven't any records?

A. No, we haven't any records. Every six years we sell all the old books, papers and orders and everything else to a paper man.

CROSS-EXAMINATION.

By Mr. Wooster:

X26. Q. Is it the custom of your firm from time to time to publish a list of rare and stock chemicals?

A. Only the stock chemicals. We have now on hand large cases of chemicals that we put up in Newark that have not been called for, or else found too expensive. People very often order, and when they find out how much they cost they don't call for them.

X27. Q. Did you ever publish any list containing any of the substances as mentioned in your direct testimony?

A. No, sir. Those substances were ordered to be made by us—for us. We were the agents of Kahlbaum—C. F. Kahlbaum, of Berlin, who made most of the organic preparations for us.

X28. Q. So that any of these materials mentioned by you which you had in stock were obtained by you from Kahlbaum?

A. On special order, yes, made for us.

X29. Q. Did he publish lists containing his products?

A. No. Kahlbaum is just now making six chemicals for us that are not in his list and never will be.

X30.Q. Does Kahlbaum publish any list?

A. Yes, an ordinary list for colleges.

X31. Q. Did he publish a list at the time you mentioned?

A. He did.

X32. Q. How many different items do you suppose you have sold Republic Rubber Company?

A. I haven't the faintest idea. I am not in that department.

X33. Q. Over what period of years have you sold Republic?

A. I know I saw the name in the correspondence, as far as my memory reaches, back to 1914—'13—'14—something like that.

34X. Q. When did you last see the correspondence?

A. I dont remember.

X35.Q. I mean the correspondence which showed that these guanidine materials were mentioned—when did you last see that?

A. I don't remember. In fact, I don't know whether I saw any.

X36. Q. You mean, you don't know now whether you ever saw any correspondence or order calling for a guanidine or guanidine derivative?

A. I don't remember, for the simple reason that people sometimes come in and fetch an order during the course of the day, and the order is charged if they have an account, and those orders I don't see. It is only the first mail in the morning that I see.

X37. Q. Were you president of the company in 1917 and subsequently?

A. No, I was vice president.

X38 Q. And you read all these twelve hundred letters every day?

A. No, sir. They were picked out. The extraordinary things were always brought to me,—if any

questions came up, as to whether we could deliver stuff, whether we could make it, or ship it.

X39. Q. But you threw away ordinary as well as extraordinary matters after six years?

A. Always do. We have to. It is enormous, and we can't carry it.

X40. Q. Are you sure it is not three years?

A. No, it is six years. We put them away every six years, and have been doing it right straight along.

X41. Q. Do you know the chemical structure of guanidine?

A. I should say so. I know the old structure. when I studied in Wurzburg.

X42. Q. And the structure of the other materials mentioned?

A. The mono—

X43. Q. Yes.

A. Or what?

X44. Q. Monophenylguanidine?

A. No, I never knew that. I never paid any attention to that. I simply was asked whether we could make it.

By Mr. Barrows:

X45. Q. Doctor, you are a chemist?

A. Yes, sir, I am a School of Mines man, '79, and then finished my course in Germany.

X46. Q. And you have studied organic chemistry?

A. I did.

X47. Q. And you have been working in chemical work ever since?

A. I have been doing research work.

ABRAHAM BRILL, a witness called on behalf of the defendant, having been duly sworn, testified as follows:

DIRECT EXAMINATION

By Mr. Edmonds:

1. Q. Mr. Brill, will you state your present residence?

A. Los Angeles, California.

2. Q. And your present employment?

A. I am not at present employed.

3. Q. Until quite recently you were employed with what company?

A. Sampson Tire & Rubber Corporation, Los Angeles, California.

4. Q. And what years were you there, and where were you employed prior to that?

A. I was there from 1924 up until September, 1925. Prior to that, I was with the Brunswick Balke & Collender Company, Muskegon, Michigan, where I went in 1917.

5. Q. And prior to 1917?

A. Prior to that, I was with the Republic Rubber Company, of Youngstown, Ohio.

6. Q. You are a graduate chemist?

A. I am.

7. Q. When and where did you graduate?

A. Carnegie Institute of Technology, 1910.

8. Q. And in these three companies that you have named, what was your capacity?

A. I joined the Republic Rubber Company as chemist, at the time I left I was chief chemist in

charge of the development. I went to the Brunswick, Balke & Collender Company as superintendent of the tire and rubber departments. When I left them I went with the Sampson Tire & Rubber Corporation as production superintendent.

9. Q. Now, at the Republic Company—First, fix the time as well as you can when you went with the Republic Company?

A. September, 1910, to June, 1917.

10. Q. Now, during the last two or three years you were in that employment, was the company making use of accelerators in its rubber products?

A. Yes.

11. Q. State what some of the accelerators were.

A. The first accelerator we used and developed was thiocarbanilid, which we used from some time in 1911 or '12 up until the time I left. Later on, we made use of hexamethylenetetramine, and some paranitrosodimethylanilin.

12. Q. Were these accelerators entirely satisfactory to you and your associates in your management of the Republic Company?

A. They were not, in every respect.

13. Q. Well, what, if anything, did you do toward finding something more satisfactory?

A. When we first obtained knowledge of the use of organic materials as accelerators, we developed this material which we subsequently found was thiocarbanilid, which we called Cromite. This was a thoroughly satisfactory material, but we realized there must be other materials which would go further and do the work required of this class of materials in a more satisfactory manner, and to that end I devoted

a considerable portion of my time. I tried a great number of substances and studied the nature very carefully with that in view.

By Mr. Wooster:

Just a moment. There is no public use or prior knowledge pleaded in this case, by Mr. Brill, or by Republic Rubber Company, and this looks like a preparation for it. I object.

By Mr. Edmonds:

Well, of course if we have not pleaded it we are not entitled to prove it, but the assumption that this is an effort to prove a prior use by the Republic Company, and therefore something we have not pleaded, is entirely an assumption without foundation. Does that answer your objection?

By the Court:

Well, we have not reached any stage, as I take it, where we can tell exactly what they are going to prove. There is no offer made. Does counsel desire one as to the proof?

By Mr. Wooster:

I simply want to reserve my objections. I don't understand what this is, and as I stated, he has not pleaded any prior knowledge by this witness or by the Republic Rubber Company as a company, and I do not want to permit it all to get in before I make my objection.

By Mr. Edmonds:

I consent to have the objection reserved, if the objection is to proving prior use by the Republic Company. I am not going to try to prove it. I am not going to try to prove anything that is not pleaded in the answer, for fear somebody might call attention to the fact that it is not pleaded in the answer.

By the Court:

Well, go ahead and we will find out what this is.

By Mr. Edmonds:

I have no objection to stating—

By the Court:

Well, there hasn't been any request for it. You may proceed.

By Mr. Edmonds:

14. Q. Were there any chemists in the employ of the Republic Rubber Company under your supervision in this period that you are speaking of, while you were bending your efforts toward finding some more serviceable accelerators?

A. During the early part of this period, I myself did most of the work, and I think possibly all of the work in connection with finding and trying of various organic substances which might be used as accelerators. During the summer of 1916, there was a change in the organization of the Republic Rubber Company, and I was put in charge of the laboratory and development department. This meant that I

would not be able to devote very much of my time to this particular work, and we had done enough along this line to realize that it was a very fertile field for further investigation, and upon talking it over with Mr. Clark, and possibly some of the other members of the organization, we decided to get a man to work along this line and devote his attention almost entirely to it.

15. Q. And this man you decided to get was to be hired for some purpose other than the usual one in the course of hiring other chemists?

A. Yes. He was hired with the particular end in view that the would devote his time almost entirely to this kind of work.

16. Q. State specifically what kind of work?

A. The trial of various organic materials in rubber compounds, with the idea of finding a rubber accelerator, which was more satisfactory than the ones which we were using at that time, or that we knew about at that time.

17. Q. State whether or not you had in mind any particular organic chemicals that you wanted him to examine?

A. We had nothing—no one definite substance in mind. I had done a lot of work on various materials and had read literature, which was more or less extensive in 1916, and one or two articles that I recall particularly summed up the various classes of accelerators into groups, and it was our idea to go right down the list and try members of the various groups. I recall particularly that I had myself tried urea, and among the substances or classes mentioned

in this paper were the guanidines, and I recall that I had tried to obtain representative members of this class, but I don't recall that I ever was able to get any. As I recall the matter, I was unable—It was not feasible for me to make any of these guanidines by the methods described in the literature that we had in our own library, and I don't recall ever going any further with making them. Neither do I recall ever having been able to get any through the chemical supply houses.

18. Q. Why was it not feasible to make them, if you can state briefly?

A. As I recall, the method given in the text-books we had called for some reagents that were rather difficult to handle, and that we had no way of preparing, and they were matters that in the press of other work we let drop.

19. Q. So this plan was developed for the purpose of trying these substances?

A. Yes.

20. Q. Who participated in the development of that plan—yourself and who?

A. Myself, with Mr. Clark,—there might have been Mr. Brown, or Mr. Peterson might have been there, but I don't recollect. But I do know I talked to Mr. Clark.

21. Q. And you two, or such others as joined with you, decided you would hire a chemist for this special purpose?

A. We did.

22. Q. What was done then?

A. We got hold of Mr. Baldwin, who was a

graduate chemist, and who had had some experience, and it was our idea to gradually educate him into the use of what organic materials we knew of at that time, and try what other materials had occurred to us that we might try and we had not had time to try, and work him into this line of work, so he could work on his own hook.

23. Q. So you hired Baldwin?

A. We did.

24. Q. Will you state when, if you can with any accuracy?

A. As near as I can recall it, it was some time in the middle of 1916.

25. Q. So Baldwin came there to the Republic plant at Youngstown and started in on this work you have outlined?

A. He did.

26. Q. Was he instructed as to what substances he should try, or was that left to him?

A. When he started in this accelerator work, I myself told him what was known—what I knew of what was known in the art, and I gave him what literature I had, and referred him to such books as I knew of that would acquaint him with what had been done. I also told him what I had done, in a brief way, so that he could start thinking on the subject and know what to do, what the general trend of his job would be.

27. Q. Beyond that did you have anything to do with the selection of the particular substances that he tried?

A. I think at first I did direct more or less his

efforts, by telling him what my ideas were and what I had done, and what I thought was very promising from my own experience and from the literature on the subject.

28. Q. Do you remember any particular books that you consulted in that connection?

A. Yes. We had a copy of Richter that I recall very clearly.

29. Q. You went through Richter and picked out such substances—

A. Yes, I went through that book many times before Baldwin came, and I may have gone through it with Baldwin; I am not sure.

30. Q. Now, these substances that you picked out and wanted to try, what did you do about them?

A. In the ordinary course of events, we would make out a list with a requisition, which would be sent to our Purchasing Department, for purchase.

31. Q. Do you personally recall any contracts with the purchasing agents in this connection?

A. Yes.

32. Q. Any circumstances in that connection that are recalled to your mind?

A. I recall that in many cases we got some rather sarcastic remarks thrown back at first, at some of the materials we ordered. After they had received prices on them, they wanted to know whether we were buying goldleaf, and remarks of that kind.

33. Q. Now, what did Baldwin do, in accordance with these instructions that he got from you?

A. Well, Baldwin, eventually after he came with the company, started compounding with various or-

ganic chemicals and recording—testing and recording the results.

34. Q. Do you recall any work of Baldwin in connection with D. P. G.?

A. I do not.

35. Q. What was the practice in the Republic Company with respect to keeping records of experiments that were made in the chemical laboratory?

A. When a new man was put on experimental work as regards compounding, he was given what we call an X-book, which he used himself, and in which were to be recorded all experimental compounding that he might do. When I presented this book to the new man, I always was very careful to impress upon him the importance of keeping complete records, giving the date and the result of the tests, whether they were satisfactory or unsatisfactory.

36. Q. Had you yourself observed this practice that you instructed others to observe?

A. I tried to as well as I could, yes.

37. Q. So among the records of the Republic Company you would expect to find an X-book with your experiments recorded in it?

A. Yes.

38. Q. Now, what about Baldwin—was he instructed to keep such records?

A. Yes, Baldwin was so instructed.

39. Q. Do you know whether you instructed him?

A. I did—I will amend that. I will say that—I don't recall instructing Baldwin, but I know that I would have, in the ordinary course of events.

40. Q. Now, you recognize this 2000 X-book of the Republic Company as a book of the character you have referred to?

A. Yes.

41. Q. Can you say whether or not any of the experiments recorded on the first six or eight pages of this book were made by Baldwin?

By Mr. Wooster:

I object to that secondary and incompetent.

A. I wouldn't want to say definitely. I do recall that Baldwin's writing was peculiar, and it might be that was Baldwin's.—I wouldn't want to say that was Baldwin's. I remember his printing is very irregular and not artistic, I do recall that.

42. Q. I call your attention to the fact that in the first column of the page which is numbered X-2005, there is a record of an experiment, in which one part of D. P. G. is shown to have been used. Do you have any recollection in connection with this?

A. No, I do not.

43. Q. So that, understanding that you do not recall that particular experiment, will you please state whether or not that experiment was in the line of what you hired Baldwin to do, and what you instructed him to do?

By Mr. Wooster:

I object. That is wholly incompetent and secondary, and merely calling for the witnesses's conclusion.

By the Court:

I think that is correct, Mr. Edmonds, in a large part, because he has presumably fully detailed the purposes of the employment of Baldwin, in the instructions given him.

By Mr. Edmonds:

I think he can give a little further testimony that will be of assistance. I recognize the fact that it is not the best testimony, because I myself have brought out the fact he does not remember this particular experiment, but this is by way of introduction to the testimony of Baldwin, which is to follow immediately.

By the Court:

Of course this question is simply whether it it along the line of the instructions he has previously detailed, and I presume the record speaks for itself in that respect, in connection with his previous testimony. Is there any question as to that—that is, that the record itself requires explanation, or is it sufficient on its face to show what it is?

By Mr. Edmonds:

If Your Honor please, this entry here of the test with D. P. G. is stated by the plaintiff to be a record which was not in that book at the time when Weiss came along and wrote some other things on the same page, and we propose to prove that it was there, and that is the purpose of this testimony.

By the Court:

Then in connection with that, you simply show the facts you have shown,—there is no question as to the relevancy of such proof as that, but in connection with that he is called upon to state, as a matter of conclusion, what is, as I think, covered by his previous testimony and by the record itself, if offered in evidence. In other words, he has already testified as to his instructions and the general work of Baldwin pursuant to those instructions. Now, wouldn't the offer of the sheet itself answer the question which you have asked him, that is, whether that experiment was along the line of his employment and his instructions given pursuant to his employment?

By Mr. Edmonds:

Possibly so, as a matter of argument, but I should think it would be better and I would prefer to have it in as a matter of direct statement by the witness.

By the Court:

Well, we will allow it to go in and overrule the objection.

Exception noted to plaintiff.

(Question read.)

A. As I go over it in my mind the work we had done prior to this time in the laboratory, as regards developing of organic accelerators, and particularly some of these classes as given in these various articles, I would say that it would be very peculiar if,

in going over this book, I did not find some work by Baldwin, in which he had tried these different guanidines. D. P. G. would be one of them.

44. Q. Will you state whether or not you have any recollection of discussing D. P. G. with Mr. Baldwin?

A. I wouldn't say that I did or did not. I know I discussed a number of substances, and that might have been among them. I don't recall. I will say, though, that I did discuss the guanidines, which was one of the classes mentioned in this particular article that I refer to.

(No cross examination.)

RALPH W. BALDWIN, a witness called on behalf of defendant, having been duly sworn, testified as follows:

DIRECT EXAMINATION.

By Mr. Edmonds:

1. Q. State your present residence, Mr. Baldwin?

A. Wilmington, Delaware.

2. Q. And your present business connection?

A. Manager of the New Way Laundry Company.

3. Q. Until recently you have been in some other line of business, have you not?

A. I didn't get the question.

4. Q. Until quite recently you were in some other line of business?

A. Up until this year I have always been in the rubber business, rubber manufacture.

5. Q. And with what company were you last employed?

A. With the E. H. Clapp Rubber Company, of Boston.

6. Q. And prior to that, with what company?

A. With the Pioneer Rubber Company.

7. Q. Well, you were at one time in the employ of the Republic Rubber Company at Youngstown, were you not?

A. Yes, sir.

8. Q. Between what years were you employed there?—Give the exact dates as well as you can.

A. I went with the Republic Rubber in the summer of 1916, and left there in the spring of 1918.

9. Q. In what capacity were you working with the Republic Company?

A. I went with the Republic as a chemist in 1916, to do special work under the direction of Mr. Brill, and later I was in charge of the Chemical laboratory, and then during the war I did factory control work.

10. Q. When you first went there, who was your immediate superior?

A. Mr. Brill.

11. Q. Your instructions came from him?

A. Yes, sir.

12. Q. Did he give you any instructions with reference to recording any experiments made by you?

A. He did.

13. Q. What did he tell you to do?

A. To always record experiments done by me in the X-book.

14. Q. A book of the character of the book in front of you there?

A. Yes, sir.

15. Q. He gave you one of those books and told you to record everything in that?

A. Yes.

16. Q. What was to be the general nature of the chemical work that you were to do when you entered the employ of the Republic Company?

A. Why, it was mostly special work that Mr. Brill outlined—especially with reference to organic accelerators, in which they were at that time very much interested.

17. Q. And what did that work on organic accelerators involve—I mean the actual work that you did?

A. Why, the preparation and trying out of different organic accelerators, that we could either make in the laboratory there or procure in the open market.

18. Q. And did you make some such preparations?

A. I don't think we made any strictly organic preparations in the Republic laboratory at that time. The facilities for this work were very limited, and I think—I cannot recollect now that we did prepare very many.

19. Q. Then these substances that you used in these tests were bought from outside concerns?

A. Yes, sir.

20. Q. Can you name some of the concerns that you know were among those from whom you bought?

A. Why, one of our best supply houses was Eimer & Amend, of New York; and I remember of getting some special chemicals—remember the name of Holland Chemical Company of Chicago.

21. Q. And what was the nature of the work that you did with these chemicals?

A. Tried them out in rubber mixes.

22. Q. You compounded a rubber mix and then made a rubber slab?

A. Yes.

23. Q. And vulcanized the slab, in the course of the usual procedure in all rubber laboratories?

A. Yes, sir.

24. Q. Will you please look at the 2000 X-book, which is in front of you, and state whether any of the entries in there were made by you?

A. This is the old X-book that was given me by Brill—I don't think it is the X-book that was given me when I went there, but one that I used while there, during the latter part of the time that I was in the chemical laboratory. There are entries made by me in the first ten pages of the book.

25. Q. Are the entries on this page X-2010 at the left made by you, or some of them?

A. Some of them were.

26. Q. And on all of the preceding pages there appear to be entries made by you, back to the first page, which is blank?

A. Yes, sir.

27. Q. Here at the bottom of the page, opposite X-2001, seems to be quite a bit of matter. Do you recognize that as having been put there by you?

By Mr. Wooster:

I object to that as leading. I suggest that counsel not lead the witness on a matter like this

By the Court:

Well, of course that is leading. It calls for a direct answer.

28. Q. Is all of the matter on that page matter which was put there by you?

A. Yes, sir.

29. Q. Look at this matter on X-2002,—is all of the matter that is written or printed there, is that yours?

A. That is all mine.

30. Q. Take the opposite page, is that yours?

A. That is mine.

31. Q. This next page, X-2003?

A. That is all mine.

32. Q. And the opposite page?

A. Yes.

33. Q. X-2004, is that yours?

A. That is all mine.

34. Q. Both sides?

A. No, I didn't write that up there (indicating).

35. Q. The matter at the top of the page opposite page X-2004, reading, "Reverse of X-2005," with some initials under it, was not put there by you?

A. No.

36. Q. That is right?

A. That is right.

37. Q. Now, will you look at the next page, X-2005, and state what, if anything, on that page was put there by you?

A. The entry number, X-2005, is in my handwriting. "Action of organic accel." is in my handwriting. The reference, "X-2004-C" in parentheses, at the lefthand top column, is mine. The printing

"diphenyl guanidine", the first column to the left, is mine. The figures in the first column are all mine. The total figure, "101," is mine. The cure "120" is mine. The entry "N. G." is mine, and the date,—all in my own handwriting.

38. Q. These figures to which you have referred, and the cure, and "N. G." and the date, are the figures and letters, and so forth, that appear in the left of the column headed "A"?

A. Yes, sir.

39. Q. What date do those figures at the bottom of the column indicate?

A. February 22, 1917.

40. Q. From the record of that experiment, to which you have referred, are you able to say whether or not you conducted that experiment at that time?

A. Yes, sir.

41. Q. Any question in your mind about that?

A. Absolutely none.

42. Q. You know you made that experiment?

A. I do.

43. Q. And what do you know as to the date when you made it?

A. On or about February 22, 1917.

44. Q. No question in your mind about that?

A. Absolutely none.

45. Q. And as to the fact that this word "diphenylguanidine" was written here by you have stated, is there any question in your mind about that?

A. Absolutely none; that is my handwriting.

46. Q. And the same as to this heading "Action of organic Accel."?

A. That is mine.

47. Q. And all of that matter that you say was put there by you, was it all put there at the same time?

A. Within about a day or two, I should say. It might not all have been entered the same day. The results down near the "N. G.", the date would probably be within two or three days from the time the compound was written. I can't recollect just exactly.

48. Q. What is the reason for that?

A. Well, when I would start to make experiments, I would enter the compound in my book for reference, and then I would give the compound to the compound man downstairs, and it might be a day or two later when I got results.

49. Q. So that the whole experiment that is referred to there might cover a couple of days, or even three days?

A. Yes, sir.

50. Q. Now, look at page X-2006,—and as there are two pages numbered 2006, it is the second one to which I refer—and state whether or not the matter appearing there was put there by you?

A. Yes, sir.

51. Q. Now, look at the matter on the page opposite—the unnumbered page opposite, is that yours?

A. Yes, sir.

52. Q. What about the matter on page 2007?

A. That is all mine.

53. Q. Including this title, "Comparison of Action of Accelerators"?

A. Yes, sir.

54. Q. And these dates at the bottom?

A. They are all mine.

55. Q. And the matter on the opposite page, in the columns headed by printed letters?

A. Well, that is another entry.

56. Q. But the matter in the columns of figures that you show was put there by you?

A. Yes, sir.

57. Q. And the other matter, up at the extreme top of the page, was not put there by you?

A. No, sir.

58. Q. Going back here to page 2007, the matter which you say was put there by you, does that include these dates at the bottom?

A. Yes, sir.

59. Q. And were the experiments recorded there made on the dates indicated by those figures at the bottom?

A. Yes, sir, on or about the date.

60. Q. What about X-2008, was the matter on that page put there by you?

A. Yes, sir.

61. Q. And similarly as to the matter on the opposite page?

A. Yes, sir.

62. Q. 2009, is that your work?

A. That is my work.

63. Q. And on the opposite unnumbered page?

A. Yes, sir.

64. Q. How about 2010,—is that your work?—I refer to the page at the left—Is that your work on this 2010 at the left?

A. Well, there is some writing there that isn't mine (indicating).

65. Q. You refer to certain words written in the

first column at the left, including "Brown crepe," "Batanga," "Usam," "Trifan," and something else that looks like "Inertia". Those words that I have just read were not written there by you?

A. No, sir.

66. Q. These parts that you have just referred to as having been put there by you are the printed parts "MRX" and "Excellerex". Is that right?

A. That is right.

67. Q. And the figures in these four columns at the left, were they put there by you?

A. Yes, sir.

CROSS-EXAMINATION.

By Mr. Wooster:

X68. Q. Did you say in direct examination where you got the D. P. G.?

A. No, sir.

X69. Q. Do you know where you got it?

A. No, sir.

X70. Q. Did you make it?

A. No, sir.

X71. Q. Did you buy it?

A. I expect we did; yes, sir.

X72. Q. I asked you if you bought it?

A. Yes.

X73. Q. You personally?

A. No, sir.

X74. Q. Who did?

A. Through the purchasing agent, I expect, of the Republic Rubber.

X75. Q. Do you not know?

A. No, sir, I don't.

X76. Q. Did you test it when you got it?

A. I tested it in the sample the same as the other.

X77. Q. How did you know what it was?

A. As I recollect, I went by the label on it. I wasn't very well acquainted with that, any more than I was with other accelerators that I was working with.

X78. Q. What was it marked on the package?

A. I don't remember.

X79. Q. Did you get the original unbroken package?

A. I don't remember.

X80. Q. Did it have a wrapper on it?

A. I don't remember.

X81. Q. Was the cork sealed, or was it a screw-top package, or what?

A. I don't remember.

X82. Q. How much was there?

A. I don't remember.

X83. Q. Can you say whether there was a pound or ten pounds, or five grams, or one gram?

A. I should say in the neighborhood of five grams. That is what they put up for a sample test.

X84. Q. You now say you bought a package containing five grams?

A. Well, I would say that would be about the amount we would get.

X85. Q. Is that the amount you ordered?

A. Yes.

X86. Q. You told the purchasing agent to order five grams?

A. That would be about the amount there would be in a sample?

X87. Q. Did you tell the purchasing agent to order five grams?

A. No, I wouldn't go up and tell him.

X88. Q. How big a package would five grams make?

A. A small bottle.

X89. Q. How much?

A. About—Oh, an inch in diameter and five inches high, I would say.

X90. Q. An inch in diameter and five inches high, filled?

A. Yes, sir.

X91. Q. And that is five grams?

A. About that, I should say.

X92. Q. What was the color of this material?

A. White crystalline substance.

X93. Q. Granular?

A. As I remember, it was crystals.

X94. Q. Crystals?

A. Yes.

X95. Q. Like coarse sugar?

A. No, finer than that, very fine.

X96. Q. Powder?

A. Yes, sir.

X97. Q. And you took this material just as you got it and put it into a cure?

A. Evidently, from the records of the X-book.

X98 Q. You took no melting point on it?

A. No, sir.

X99. Q. Did you order material of any melting point?

A. I don't remember.

X100. Q. Did you order chemically pure material?

A. I don't remember.

X101. Q. At that time did you know as a fact that drug houses frequently carry what they call "C. P." and also commercial grades of the same material?

A. I don't know as I could state that I knew whether drughouses carried either one.

X102. Q. You are sure you did not make this material?

A. No, sir.

X103. Q. You know you didn't make it?

A. I know we didn't.

X104. Q. Did you specify any melting point for this material?

A. That I don't remember.

X105. Q. What was the melting point of D. P. G.?

A. 147.

X106. Q. Where did you get that?

A. Out of my literature.

X107. Q. What literature?

A. I don't remember.

X108. Q. When did you get it?

A. In refreshing my memory, I looked it up.

X109. Q. I asked you when you got the information that D. P. G. melted at 147?

A. I don't know.

X110. Q. Have you recently looked it up?

A. Why, I have looked over some of the records of D. P. G. I don't know—I have known it for some time, what the melting point of it was.

X111. Q. What records have you recently looked over?

A. None.

X112. Q. You just said you had recently looked over some records.

A. I don't know to what you refer by "records."

X113. Q. Records that said anything about D. P. G.

A. The only—practically the only records I have read over is the last testimony in this case, or in the Anilin National case.

X114. Q. You mean your testimony in the New York case, of Dovan vs. National?

A. My testimony and other testimony in there.

X115. Q. Oh, you read a lot of testimony in this Dovan vs. National record before testifying here?

A. Yes; looked it over, naturally.

X116. Q. Why should you look over the entire record?

A. What was that?

X117. Q. Why should you look over the entire National record?

A. I am naturally interested in it when I am testifying in the case.

X118. Q. Now, how long had you been at the Republic by February 22, 1917?

A. Why, I went with the Republic in the middle of the summer of 1916.

X119. Q. What month?

A. To the best of my recollection, about August.

X120. Q. You are not positive as to the month when you went there, but you are positive as to this test on X-2005. Is that right?

A. Yes, sir.

X121. Q. You have got the day of the test—

A. Right before me.

X122. Q. Right in your mind?

A. Right before me.

X123. Q. Oh, you read it from this book?

A. Yes, sir.

X124. Q. Without the book, could you say when the test was?

A. Well, just from memory,—that is refreshed in my mind now.

X125. Q. You remember February 22, 1917?

A. Only through the records.

X126. Q. But you don't remember the day you went with the Republic?

A. No, sir.

X127. Q. What did you do at the Republic when you first went there?

A. Why, I worked on accelerators and did other special work that Mr. Brill gave me.

X128. Q. What was the first accelerator that you worked on?

A. Thiocarbanilid.

X129. Q. What did you do with it?

A. Experimented with it, became acquainted with it.

X130. Q. Analyze it?

A. No.

X131. Q. Take a melting point on it?

A. I don't remember.

X132. Q. Make a test for ash?

A. Why, I expect I did. That is rather routine work. I don't remember.

X133. Q. What was the next you had to do with?

A. Why, I don't just remember the order, the way I took them up. I experimented with several trade accelerators.

X134. Q. What were their names?

A. Well, we had samples of Excellerex, and I don't recall just—

X135. Q. I mean, prior to February 22, 1917, what accelerators had you worked with at the Republic?

A. They are in the book there.

X136. Q. I asked you to state from memory?

A. I am not able to state; I don't remember.

X137. Q. How many had you worked on yourself before you, as you say, made this D. P. G. test,—how many different accelerators?

A. Oh, I should say four or five.

X138. Q. Will you give their names?

A. I don't remember.

X139. Q. You now say that D. P. G. was about the fifth or sixth on the list of those you worked with?

A. It is a matter of record in the X-book there.

X140. Q. I asked you for the recollection.

A. I should say fourth or fifth or sixth, somewhere around in there—just a few.

X141. Q. And how many tests had you made on the others—roughly?

A. Oh, some of them I would make four or five tests on.

X142. Q. What was your occupation just before you went with the Republic?

A. I was doing some work for the H. Koppers Company.

X143. Q. H. Koppers Company?

A. Yes, sir.

X144. Q. That is not a rubber company, is it?

A. No, sir.

X145. Q. What is it—coal tar?

A. By-products.

X146. Q. By-products?

A. Yes, sir.

X147. Q. What was that work?

A. Doing some laboratory work.

X148. Q. Laboratory work on what?

A. On the recovery of nitrogen as a by-product in coke-oven work.

X149. Q. And you went from that by-product and coke-oven work into a rubber company and started right away to know all about rubber compounding and how to put accelerators in. Is that right?

A. I did not so state.

X150. Q. Well, did you?

A. No, sir.

X151. Q. But you learned very fast on rubber after you went with the Republic?

A. No, sir; I had had previous experience in rubber.

X152. Q. You had had previous experience in rubber where?

A. With the Ajax Rubber Company, at Trenton.

X153. Q. For how long?

A. Three years.

X154. Q. During what period?

A. 1912 to '15.

X155. Q. Doing what?

A. Laboratory work.

X156. Q. On what?

A. Why, it was routine work on ingredients of rubber.

X157. Q. You mean, testing rubber materials for specifications?

A. Yes, sir.

X158. Q. You didn't do any work on curing rubber at the Ajax, did you?

A. No, sir.

X159. Q. How much of that five grams did you use in that test of February 22, 1917?

A. I don't remember.

X160. Q. How much was the batch you made up?

A. I don't remember that.

X161. Q. You don't remember any of the weights?

A. No, sir.

X162. Q. Can you say now what was in that batch and how much of each?

A. Fifty pounds of smoked sheets—fifty parts of smoked sheets, forty-seven parts of zinc oxide, three parts of sulphur, one part of D. P. G.

X163. Q. You don't know how big the parts were?

A. I don't remember.

X164. Q. In the National case, you were asked if you could recall where the Republic Rubber Company obtained the D. P. G. which you say you used, and you answered, "I cannot." That was in 1923. You now say you had the purchasing agent buy it. Which answer is correct?

A. Both, I should say.

X165. Q. Why could you not recall that you had the purchasing agent buy it, when you testified in 1923?

A. I don't think I was asked the question.

X166. Q. I will read X-34 of your direct examination into the record, and ask you the same question now: "Can you now recall where the Republic Company obtained the diphenylguanidine which you say you used in your experiment recorded there?"

A. No.

X167. Q. So you are not positive now whether the purchasing agent got it for you, or whether you found it in the street, or found it on a shelf in your place, or somebody gave it to you, are you?

A. Just what question do you want me to answer—the one in the book or the one you asked me?

By Mr. Wooster:

I will withdraw the question.

X168. Q. Can you now state of your own recollection whether you found that D. P. G. in your place, or somebody gave it to you, or you had the purchasing agent get it for you, or you made it yourself.

A. I did not make it, and I would expect that

the purchasing agent would purchase it, but I am not certain as to where it came from.

X169. Q. What did you mean by the notation "N.G." opposite the printed word "stretch," in this test dated 2-22-17?

A. That particular experiment was no good.

X170. Q. In what respect?

A. No doubt the slab was over-cured.

X171. Q. How do you know that?

A. In view of information I now have along those lines.

X172. Q. You mean, you now conclude that "N.G." meant overcure, because of information which you have acquired since?

A. I am not exactly certain that that is the answer.

X173. Q. Couldn't "N.G." mean undercured?

A. That experiment, as outlined there, in my opinion at the time, was no good. For what reason, I am not able to state definitely.

X174. Q. You mean, you cannot now state whether it was undercure or overcure?

A. Not strictly from that record.

X175. Q. From that record?

A. From my own knowledge of rubber.

By Mr. Edmonds:

Is it understood that the meaning of this last thing in the record is that he cannot say it was overcured or undercured from what appeared there, but as a deduction from his present knowledge, he thinks it was overcured?

By Mr. Wooster:

That is what he said.

By Mr. Edmonds:

I thought so. I have nothing further.

Adjourned until Tuesday, October 13, 1925, at 10 o'clock, A. M.

MORNING SESSION.

Tuesday, October 13, 1925.

By Mr. Edmonds:

I offer in evidence a certified copy of the affidavit of Mr. Weiss' in the National case, which was referred to in the cross examination of Mr. Weiss and at that time was marked for identification, Defendant's Exhibit "A".

By Mr. Kennedy:

I ask for what purpose that is introduced. Whether it is for the purpose of impeaching or attacking the credibility of Mr. Weiss.

By Mr. Edmonds:

It is offered for any purpose which will serve and among others as showing gross inaccuracy in the testimony of Mr. Weiss.

By Mr. Kennedy:

That is objected to. There has been no offer to have the witness Weiss explain discrepancies if there are any, between his testimony and previous statements.

By the Court:

He was asked on cross examination whether he did not make certain statements in the affidavit. If there is anything contradictory of this evidence I think it may be introduced. At least portions which differ from the testimony given in the instant suit.

By Mr. Kennedy:

I had overlooked the fact that his attention was called to some particular parts of that affidavit and as to those parts of the affidavit of course my objection would not apply, but I repeat it as to the balance of the affidavit.

By the Court:

It is irrelevant in so far as anything else except the portions which are offered for the purpose of showing that he made a different statement at another time.

By Mr. Edmonds:

I also offer in evidence a copy of the application of Mr. Weiss for employment with the National Analine & Chemical Company which is marked defendant's Exhibit "B". It was conceded in that connection that that is an accurate copy of the original.

I also offer in evidence the original application of Mr. Weiss for employment with the Firestone Rubber Company which is marked Defendant's Exhibit "C".

I also offer in evidence a copy of the Brief for Weiss in the interference referred to in the

cross examination of Mr. Weiss with relation to the accelerator known ditolylguanidine. This brief being marked Defendant's Exhibit "D".

I also offer in evidence as Defendant's Exhibit "E" the original letter from Mr. Daniels to Mr. Stevens which was identified by Mr. Daniels during his cross examination.

I offer in evidence Exhibit "E" being a copy of a paper written by Messrs. Kratz, Flower and Coolidge and read by Dr. Kratz at the meeting of September, 1919, of the American Chemical Society at Philadelphia, Pa.

By Mr. Wooster:

The publication date of this paper as of April, 1920, has heretofore been agreed to, but the paper itself is objected to as immaterial and irrelevant and as merely a fortuitious publication made by parties not shown to be in privity or connection with Mr. Weiss in any way and long subquent to his date of invention. So far as the date of the reading of this paper as between September 2nd and September 6th, 1919, is concerned the alleged reading thereof is objected to as not shown to be exactly as appears by the later publication. It is further objected to as incompetent because a mere reading or lecture is not in any event a statutory bar, nor in this case did such reading antedate the date of invention by Weiss of the patent in suit.

By the Court:

If there is a disputed question as to the time of invention and other matters and the paper is

in view of the testimony that has already been given in connection with it, it is admissible, the objection is overruled and an exception noted.

By Mr. Edmonds:

I offer in evidence as Exhibit "G" the circular of the Dovan Chemical Corporation, which was referred to in the cross examination of plaintiff's witness Woodward. Also during the cross examination of the witness Woodward reference was made to another circular of the Dovan Chemical Corporation, a copy of which appears in the proceedings in the Patent Office which led up to the grant of the Weiss patent in suit.

I now offer in evidence as Exhibit "H" a certified copy of the file wrapper as we call it in the Patent Office, of the patent in suit. That is a record of the proceedings that led up to the grant of the patent.

I also offer in evidence as Exhibit "I" the original stipulation signed by the solicitors of both parties to the suit covering certain items of proof and designed primarily to eliminate from this suit certain proceedings which would have amounted to a duplication of what was done in the National suit. This stipulation provides that certain depositions that were taken in the National suit may be offered in evidence here and received with the same force and effect as if those witnesses were called here and gave their testimony. Perhaps at a later time it may assist your Honor for me to give a brief statement as to what is in those depositions. In addition to that the

stipulation provides that a number of publications in magazines along in 1916, 1917 and 1918 shall be accepted without further proof that they were published as of those dates. That applies to a number of publications that we shall have occasion to offer in evidence. Perhaps it would serve the purpose best to have this stipulation copied into the record.

STIPULATION.

"It is Hereby Stipulated by and between counsel for the parties hereto that, as a portion of defendant's case herein, copies of despositions heretofore taken in the suit of this plaintiff against National Aniline & Chemical Co., Inc., referred to in companion stipulation of even date herewith respecting said suit and plaintiff's prima facie case, may be offered and received in evidence herein and shall be given the same force and effect herein as if each of the said witnesses in the National Aniline suit were produced, sworn and so testified herein, as follows:

SETH R. CLARK
JAMES W. KINSMAN
ALFRED L. LOEBENBERG
ROBERT L. MOORE
HENRY V. MOORE
WILLIAM E. RUSSELL
NORMAN A. SHEPARD

and together with the following exhibits offered in evidence by defendant in said National suit

and received and marked in evidence therein as follows:

Article by Kratz, Flower and Coolidge in Journal of Industrial and Engineering Chemistry, April, 1920, pages 317-324, defendant's Exhibit A.

Abstract on page 430 of Chemical and Metallurgical Engineering for Oct. 1, 1919, of paper by Kratz, Flower and Coolidge, subject to proof by defendant of the actual date of publication thereof, part of defendant's Exhibit B.

Set of Cards showing 1913 work, Exhibit C.

Set of Cards showing work at Norwalk, defendant's Exhibit D.

Notebook sheets, defendant's Exhibit E.

Tests on T-63 compound, defendant's Exhibit K.

Firestone employment application, defendant's Exhibit I.

National employment application, defendant's Exhibit M.

Metallurgical and Chemical Engineering, Sept. 1, 1916, pages 231-234, article by King, defendant's Exhibit O.

Journal of Society of Chemical Industry July 31, 1917, pages 782-789, article by Twiss, defendant's Exhibit P.

The India Rubber World, May 1, 1921, pages 572-573, article by Scott and Bedford, defendant's Exhibit Q.

Journal of Industrial Engineering Chemistry for January, 1922, pages 25 to 31, article by Bedford and Sebrell, Exhibit 15.

Translation, Le Caoufchoue et La Guttapercha, July 15, 1919, pages 9861-9864, article by Du Boso, defendant's Exhibit S.

File Wrapper and contents of Weiss patent in suit #1,411,231, defendant's Exhibit X.

Plaintiff waives other proof than the dates appearing thereon of the publication dates of said Exhibits A. O. P. ", S and 15.

In making the within stipulations as to the named witnesses and exhibits to be received in evidence herein on behalf of defendant in order to save time and expense, plaintiff reserves all rights of objection other than as to mode of proof and also all rights of rebuttal. Dated, June 3, 1925. (Signed) J. S. Wooster, Counsel for Plaintiff; (Signed) Pennie Davis Marvin Edmonds, Counsel for Defendant."

By Mr. Edmonds:

I offer in evidence as Exhibit "K" a copy of Chemical and Metallurgical Engineering for Oct. 1, 1919, page 430, this being one of the articles referred to in the stipulation that I have just mentioned.

By Mr. Wooster:

This stipulation refers to this article but says "Subject to proof by defendant of the actual date of publication thereof." This publication is ob-

jected to by plaintiff as incompetent because its actual date of publication is not proven, the printed date of Oct. 1st, being not even prima facie proof. This is the paper as to which counsel for defendant stated the other day he had no witness to prove the publication date.

By Mr. Edmonds:

May I say that the publication did not come into the hands of the public until a few days after Nov. 12, 1922.

By Mr. Wooster:

Nov. 12th or Nov. 15th or 16th or thereabouts, 1919, which was less than two years before the filing date of the patent in suit.

By Mr. Edmonds:

Then I think I am entitled to have the publication admitted in evidence as a publication of the last half of Nov. 1919.

By Mr. Wooster:

We make the same objections to it then as we do to the complete paper published in April, 1920.

By Mr. Edmonds:

That is the complete paper of Kratz. The entire paper as published in April, 1920, Exhibit "E".

By the Court:

You are now offering another paper.

By Mr. Edmonds:

A brief abstract of it published in the preceding fall.

By the Court:

We will admit it subject to later ruling.

By Mr. Edmonds:

I offer in evidence a copy of Metallurgical and Chemical Engineering of Sept. 1, 1916, pages 231, 232, 233 and 234 containing an article on "Rubber Vulcanization Accelerators, by Andrew H. King being marked Exhibit "L".

I offer in evidence a copy of pages 782 to 789 of the Journal of the Society of Chemical Industry for July 31, 1917 containing an article on the chemistry of Vulcanization by D. F. Twiss, marked Exhibit "M".

I offer in evidence an article appearing in "The Rubber World for May 1, 1921 pages 572 and 573 containing an article on Reactions of Accelerators during Vulcanization by Scott and Bedford marked Exhibit "N".

I offer in evidence as Exhibit "O" a translation of an article that appeared in a French magazine for July 15, 1919 entitled "Le Caoutschoue et La Guttapercha." The stipulation previously referred to covers the publication of the original article in French, and the fact that this document is a translation of it.

DR. GEORGE D. KRATZ, called on behalf of the defendant, being duly sworn, testified as follows:

DIRECT EXAMINATION

By Mr. Edmonds:

1. Q. Will you state your present residence and your present business connection?

A. My present residence is Akron, Ohio. I am vice president of the Falls Rubber Company.

2. Q. That is located where?

A. It is located on Cuyahoga Falls, Ohio.

3. Q. Just outside of Akron?

A. Yes, sir.

4. Q. You are the vice president. Are you the active managing officer of the company under the present board of directors?

A. Yes, sir.

5. Q. And the Falls Rubber Company is engaged in the manufacture of automobile tires and tubes? That is their primary product?

A. We make practically nothing but tires.

6. Q. Are you a graduate of a technical school and if so what and when did you graduate?

A. I graduated from Cornell University in 1912 with the degree of Bachelor of Chemistry.

7. Q. What did you do on leaving college?

A. On leaving college I went to the Diamond Rubber Company in the research laboratories under Dr. David Spence, for whom I had worked in the summers of 1910 and 1911 doing work along general research lines in rubber.

8. Q. How long did you stay with the Diamond Rubber Company?

A. I went there in February, 1912, and stayed with the Diamond until April 1, 1914, as I remember it, during which time the consolidation of the Diamond Rubber Company and the Goodrich Rubber Company took place, and there was some ill feeling on the part of some of those who had previously been with the Diamond, and Dr. Spence and his associates decided to form a company of their own and asked me to go with them and at that time in April, 1914, I left to join Dr. Spence at Norwalk, Conn., with the Norwalk Rubber and Tire Company.

9. Q. How long did you stay with them?

A. I was with the Norwalk almost three years to the day, from April 1, 1914 to about April 1, 1917, at which time I went to the Falls Rubber Company to take charge of their chemical laboratories staying with the Falls Rubber Company since April 1, 1917, until the present time.

10. Q. When you were with the Diamond Company and prior to its consolidation with the Goodrich Company was any work done there on accelerators for the vulcanization of rubber?

A. The Diamond Rubber Company was really the birth place of accelerators according to my idea and I believe according to—

By Mr. Kennedy:

Objected to. That is a conclusion on the part of the witness and I object to it as not responsive to the question and volunteered.

By the Court:

We will allow the motion. The witness should answer directly.

By Mr. Edmonds:

11. Q. Will you state what was done there at the Diamond Company in the way of accelerators, refraining from any expression of opinion as to whether that was the birth place of the use of accelerators?

A. Certainly organic accelerators were used by the Diamond Rubber Company in 1910 to my actual knowledge and in 1911 and 1912 I myself worked with organic accelerators at the Diamond Rubber Company, together with the other members of the laboratory, and the research laboratories at that time were more interested in organic accelerators than in any other one substance.

By Mr. Kennedy:

I do not like to be interrupting because it delays things, but at the same time for the purpose of really shortening things I think this witness should be instructed to answer the question. I object to that part of his answer, and move to strike it out, in which he says that in 1910 the Diamond Company was working on accelerators. He wasn't there. He didn't reach there until 1912.

By the Court:

That is a direct statement. However it may later develop under cross examination that it should be stricken out.

By Mr. Edmonds:

12. Q. Will you state what the basis of your knowledge is about the work on occelerators at the Diamond in 1910?

A. Your Honor the attorney for the plaintiff just mentioned that I was not at the Diamond in 1910. I just previously said that I was there in the summer of 1910 and the summer of 1911 and went to work there permanently in 1912.

13. Q. So that your statement is based on actual knowledge of what you, yourself did?

A. Yes, sir.

14. Q. Do you know whether the Diamond Company took any prominent part in the development of the use of organic accelerators in the vulcanization of rubber?

A. They took the leading part.

By Mr. Kennedy:

That is objected to and I move to strike it out on the ground that there is no foundation laid for such statement by this witness.

By the Court:

Is there any contention on your part that this is the original of accelerators in rubber. I don't so understand it. If there is not it seems to me we are wasting time on these motions.

By Mr. Edmonds:

15. Q. During the course of your work with the Diamond Company, did you, yourself do any work in connection with one of the accelerators of rubber vulcanization?

A. I did, yes, sir.

16. Q. Will you state just what that was that you did while with the Diamond Company, that is, prior to 1914 when you say you left them?

A. In 1913 I prepared certain derivatives of guanidines, particularly naphthylguanidine, and so forth.

17. Q. Will you state a little more fully what that work was and the nature of it, and the result of it?

A. The work briefly was the condensation of alphalithasmine with thiocarbanilid, by heating. That is, the reaction product was a guanidine derivative, probably a thiophenylguanidine, and that substance was tested out over a range of compounds in rubber; that is, I took portions of the reaction product and mixed it in with the rubber and sulphur, vulcanized the two over a range of times and temperatures, and tested the different slabs to note whether the product vulcanized faster than without any accelerator present, or if it vulcanized faster than either one of the constituents that went into the mentioned products.

18. Q. Was this work of yours particularly with guanidines in line with the general line of work that you were doing with the Diamond Company?

A. It was along the general lines that I was doing, yes, sir.

19. Q. Will you state what the papers that I now hand you are?

A. The cards represent my own personal work with regard to the preparation of diphenylguanidine. They show the object of experiment, the method of

preparation of the substance, the preparation of the compounds, the method of testing and briefly the results of the tests.

20. Q. Those are your personal records?

A. Yes.

21. Q. Where did they come from?

A. These came from my personal files.

22. Q. In Cuyahoga Falls?

A. My home in Akron.

23. Q. State generally what that personal file is?

A. The file represents my own record of the work that I have done in chemistry since 1910 and consists of cards of this size and type filed according to the regular subjects by letter. I can't say the exact number of cards but it runs into the thousands.

24. Q. Thousands of cards of which these are samples and all made out by you?

A. Yes, sir, that is all the original experiments were made out by me.

25. Q. Do all of them relate to accelerators or is there a special group relating to accelerators?

A. The cards relate to my work with rubber. There are a large number of cards on accelerators.

26. Q. And they are collected together by themselves?

A. There is a drawer for accelerators.

27. Q. And in that drawer there are thousands of cards?

A. I wouldn't say thousands of cards on accelerators, but there is a large number of cards.

28. Q. Many hundreds?

A. Probably.

By Mr. Edmonds:

I will offer in evidence the cards just referred to by Dr. Kratz, as defendant's Exhibit "P".

By Mr. Edmonds:

29. Q. You say you left the Diamond Company in 1914 and went with the Norwalk Rubber Company and there you say you work in association with some Dr. Spence who had been with the Diamond. Who else were you associated with?

A. My immediate superior was Dr. William Russell, with whom I had worked in Akron, both of us being under Dr. Spence.

30. Q. Is that the Dr. Russell who testified for the defendant in the National Anilin suit on this Weiss patent?

A. Yes.

31. Q. You two, were associated in the Norwalk Company?

A. Yes, sir. We were the only two men when we first went there who were directly working on chemical work.

32. Q. And were you closely associated?

A. We were very closely associated. In fact we roomed together for a period of the year.

33. Q. And you were both working with the Norwalk Company on the same lines of Chemical work?

A. Yes.

34. Q. What was the nature of that work?

A. When we first went to Norwalk of course there was no laboratory inasmuch as we converted an old plant into a rubber factory. Our first work was

to build a laboratory to carry on the routine tests necessary to get started and then we prepared certain chemicals and accelerators for use in the factory when it became started. Our work there was amplified more than it was at the Diamond because we actually prepared at Norwalk many of the accelerators that were used in the factory.

35. Q. So your work included not only experimentation but supervision of the actual manufacture of accelerators for use in the manufacture of rubber?

A. In many cases, yes.

36. Q. When you first went there you had to organize the laboratory and thereafter you started this experimental work. In the course of this experimental work while still at Norwalk did you do anything further with guanidine and guanidine derivatives?

A. Yes. We prepared our original accelerators at Norwalk for actual use in the factory and then later on Mr. Smith one of the editors, and I believe owner, of the India Rubber Review, who was the father-in-law of Dr. Russell, asked us to prepare a paper for his publication. In the course of this correspondence I prepared a paper for him on Rate of Vulcanization in Factory Output. This was in 1916 as I remember it. That paper according to Mr. Smith was very well received by his subscribers and he asked us to give him material for additional papers. In the course of that work, the preparation of the paper there was certain work carried on with regard to accelerators, which, by the way, included guanidines, but on going over it with Dr. Russell he concluded that the work was of practical importance and not a subject for publication. That paper never appeared

but in the course of its preparation we did certain work on guanidines and in fact had been doing it prior to that time.

37. Q. Will you state just what that work was?

A. That work consisted in the preparation of a series of closely related compounds to determine their accelerating activity, as we desired to find out whether or not it would be possible to anticipate in advance what the accelerating activity of certain substances might be. That is, we wanted to find out if knowing the activity of one substance we could calculate the activity of another substance very closely related to it chemically. On going over the different series of compounds, the first accelerator that was considered, I believe, was thiocarbanilid, which of course, was one of the very earliest and best known accelerators. Also it was a very good substance to experiment with as the construcion of it chemically, its formulae, lends itself to easy change and it is closely related to a number of other substances. For example another name for thiocarbanilid would be diphynelures, as I remember it. We would also get a good start with certain ureas, and build up from complex compounds, and as I mentioned before we ought to be able to calculate the accelerating activity of some of these compounds. The result was we started in with the simplest, namely, the urea and thiourea, monophenylguanidine and diphenylguanidine. They are all related, and worked these out and prepared them after making my theoretical tests, and the actual compounds, and determine their purity. I then took the pure substances and mixed them in with my rubber and sulphur to determine whether or not the addition

of these substances would increase the rate of vulcanization of the rubber. That of course, involved a great deal of work inasmuch as it was necessary to prepare not only one compound, but several compounds or mixtures, vulcanizing each mixture not only at one temperature but over a range of temperatures, and then taking an estimate of the quality or strength of the different rubbers, also by physical tests and the ordinary thumb and tooth method. Then after you have done all that you usually find that you have misjudged your quantity and you have to repeat the experiment with either a greater or lesser amount of accelerator, or with a shorter or longer range of time. It was a rather elaborate piece of work and I felt very conclusive.

38. Q. Just what did this work involve in the way of what it was that you produced and the laboratory tests that you referred to in each instance, results in the production of what?

A. You mean the physical results?

39. Q. Yes.

A. It results in a slab of rubber which the average laboratory practice has for test work usually about five inches by five inches by three-sixteenths of an inch thick. Those slabs are made in that particular size and in order that they may be easily adaptable for handling, that is, by the thumb and tooth method, or will be large enough to test on a testing machine by punching out the desired type of sample that you wish from this slab. Usually we got three test samples from one of these slabs.

40. Q. You had a vulcanizing press for making these slabs in your laboratory?

A. Yes, we have three as I remember it.

41. Q. What I am getting at is that the usual procedure, a standard procedure in chemical laboratories, in the mixing of batches and making vulcanized slabs in a press were you doing something unusual in that particular work?

A. No. Your average laboratory particularly a small rubber company, and even the large ones, consist primarily of a small mixing mill which is identical with large mixing mills in the factory and two or three vulcanizing presses for the preparation of these slabs. You simply take the prepared batch of rubber, put it in the proper type of moulds, put the moulds in the vulcanizing press and put it under hydraulic pressure, with a steam heated plate on either side. The steam heated plate heats up the rubber mixture and vulcanizes it. That is the common practice of preparing test slabs.

42. Q. And always has been?

A. So far as I know, yes.

43. Q. I show you another group of cards, will you state what they are, and in whose handwriting they are, and what their significance is?

A. This first card shows the formulae used for testing different substances more or less closely related to thiocarbanilid. Upon it I have expressed the amounts of these substances, to give an accelerating activity equal to aniline. The second card No. 3, outlines a further experiment with reference to phenyl-mustardoil, which was found to be inactive, that is, it did not accelerate the vulcanization of rubber. It is, however, of interest inasmuch as phenyl-mustard-oil has a very powerful smell and it is one of the de-

composition products of thiocarbanilid. It was thought at that time when we carried on those experiments that possibly it might be the accelerating principle or part of sulph-carbanilid. This experiment shows that is was not.

The other cards show a similar experiment and outline the activities of the substances.

The last card gives a brief method of preparing the different substances used. In this connection here, I might mention that the urea which I prepared at that time heated ammonium-cyanid—the action of it is somewhat different from the action you get by buying the absolutely C. P. product on the market.

44. Q. In whose handwriting are the notations on these cards?

A. These cards are all in my own handwriting.

45. Q. Are the cards from your personal collection of cards in Akron, in connection, as you stated, with the other cards?

A. Yes.

46. Q. And you found them there yourself?

A. Yes, sir.

47. Q. So far as you know they had been there until you got them out for use in the litigation on this Weiss patent?

A. I got them out for use in the litigation of the National Anilin Company.

48. Q. Now as I understand that is a record of just what you did at Norwalk for your personal use. Did you also leave at Norwalk any record for the company to retain, with reference to this same work?

A. Yes. I left a more complete record for the company than is probably shown by those cards.

49. Q. What is the group of pages that I now hand you?

A. These sheets are the original sheets left with the Norwalk Tire and Rubber Company outlining the work which was summarized on the cards. However, they go into the details of the proportions much more completely than is shown on the cards. In fact these records are about as complete as you ever find laboratory records.

50. Q. In whose handwriting are they?

A. They are all in my own handwriting.

51. Q. Now did you state just when it was that you did this work at the Norwalk Company?

A. This work was done over quite a period of time. Not later than October 31st or November 1, 1916. You understand that the work represented by these sheets here and the cards cannot be written up until the experiments have actually been completed, and as to just how much prior to the dates given on these sheets the work was carried on I couldn't say.

52. Q. These personal cards of yours and the Norwalk record sheets both cover the same line of work, the same work done by you?

A. Yes, that is right.

By Mr. Edmonds:

I offer in evidence the second group of Dr. Kratz's personal cards as Exhibit "Q".

I also offer in evidence the Norwalk record of Dr. Kratz's work as Exhibit "R".

By Mr. Edmonds:

53. Q. Now will you state whether or not this Norwalk record, Exhibit "R" is a record of the making of individual tests, the production of individual test slabs, or a record of the conclusion drawn from the production of many slabs?

A. No. For example here you will find half a dozen or more different test formulae, showing the mixtures that were used to try out these different substances. Each one of these mixtures added up to something over four or five hundred grams which is enough to prepare at least four or five test slabs. Each of these test slabs was then vulcanized at different temperatures; that is, the batch was divided into four parts, slabs were made and the four slabs vulcanized at different temperatures. In some cases different amounts of the accelerator were used. That is general practice, and each one of these mixtures here does not represent one exepriment, but represents possibly several experiments before you got the right mixture for the purpose.

54. Q. Is there anything unusual about the formulae used aside from the accelerator used?

A. No. That formulae is an old, old formulae that we used at the Diamond in the old days and are still using at the Falls Rubber Company today.

55. Q. And in that old and common formulae you used one accelerator after another to get comparative results?

A. That is right.

56. Q. On this first page of the Norwalk Record, Exhibit "R" the first test is headed S. C. What does that S. C. stand for?

A. That stands for sulphcarbanilid.

57. Q. Then should one understand from that that the first test included two hundred parts of white para rubber, two hundred parts of zinc oxide, ten parts of sulphur and six parts of sulphocarbanilid?

A. That is right.

58. Q. A similar reference to the other formulaes would determine what experiments they represent?

A. That is right.

59. Q. For instance in the fourth column what was the accelerating substance used?

A. That would be aniline.

60. Q. Take the first column of the first row. What accelerating substance was employed there?

A. That is thiourea.

61. Q. And the next column after that?

A. That is diphenylguanidine.

62. Q. And the next column after that?

A. That is another experiment with diphenylguanidine.

63. Q. How do those two experiments differ?

A. Those differ in the same way as I mentioned a few moments ago. In trying out your substance you would not always select the right amount. I was comparing here to determine the amount of the different substances that equal a certain amount of thio, which were two well-known substances capable of general application and comparison. I thought that the d. p. g. apparently was to equal—for example in this first experiment d. p. g.-2, I evidently felt that half of it—it was about twice as strong as the thiocarbanilid marked S. C. because I only used just one-half as much. On the other hand when I actually

made those experiments I found that it was far stronger than I had anticipated. The result was that I cut the quantity down to one per cent. That involved the preparation of all of these test slabs that I mentioned, testing them and vulcanizing them at certain temperatures and so on. Then when I found that I had used too much there, I cut it down to one part, in the d. p. g.-2 experiments. I found that was too strong and finally cut it down to seven tenths of one part. In the d. p. g.-3 experiments. I finally repeated it again without the zinc oxide, which is sometimes important, because certain accelerators like thiocarbanilid react very well in the presence of zinc oxide but do not react at all or very mildly if zinc oxide is absent.

64. Q. These figures are all "parts"?

A. Those figures all represent weights.

65. Q. What do these figures represent—parts, percentage, parts by volume, parts by weight or what?

A. They all represent parts by weight.

66. Q. This duplication of the tests designated d. p. g.-3 with the same amount of d. p. g. but with no zinc oxide, is what is represented in the experiment recorded here as d. p. g.-4 is that correct?

A. That is right.

67. Q. What does the record on the next line headed d. p. g.-5 represent?

A. That represents cutting down the amount of d. p. g. from .07 grams to .5 grams. By the way I should call attention to the fact that what looks like an "f" there evidently is not. That refers to d. p. g.

68. Q. Now will you state what is recorded on the second page of this Norwalk record, Exhibit "R"

and what the relation of that record is to what is recorded on the first page?

A. The second page really summarizes, with foot notes, the results that were obtained on the first page. That is, I show here the general formulae that was used for making all of these tests with the exception of the amount of accelerator, which I left blank. Then I have taken the results that I obtained by making all of these test slabs, and forming an estimate of their quality and strength which as you see here in the case of d. p. g. involved four or five experiments, that is, four or five separate experiments and a large number of slabs and tests. I summarize that on the second page by referring back to anilin as a standard. That is, this table shows that a certain result with regard to the rate of vulcanization is obtained by using three and a half per cent. of anilin in the mixture. These are expressed in percentages and not in grams. Then with anilin at 3.5 the table shows that the same results were obtained with three per cent. dithio———, the same result was also obtained with 1½ per cent. of monophenylthiourea and with only one per cent of thiourea. Then it also shows that when we come to the guanidines that 1.75 per cent. of triphenylguanidine is equal to 3½ per cent. of aniline or that a twenty-five per cent of diphenylguanidine is equal to 3½ per cent of anilin. In other words that less of one-tenth of the amount of either mono or diphenylguanidine accomplishes the same result as is obtained by anilin. The last figure here refers to urea that I mentioned awhile ago. That figure is difficult to repeat with absolutely chemically pure urea. I prepared the urea used in this experiment by

heating amoniumcyanid and I have repeated that experiment on other occasions and I always get better results with the product I prepared than you would with C. P. Then in addition to expressing these results in the form of a table I made comments down here (Ind.) with reference to certain of them and the peculiarities of compounds as affected by the accelerator. That about summarized the second sheet.

69. Q. Is it proper to say that this table on the second page is a summary of the results recorded on the first page?

A. Yes, it certainly is.

70. Q. A summary in the form of an expression in figures of the relative accelerating values of certain substances is recorded on the first page?

A. That is right.

71. Q. From what sources did you obtain these various accelerating substances that you used in these tests?

A. I used C. P. commercially pure laboratory reagents if I had them or if I didn't have them I prepared them myself as certain of these could be obtained on the market at that time.

72. Q. What about the diphenylguanidine?

A. I prepared that myself.

73. Q. Is there anything in that Exhibit "R" that refers in any way to a preparation of that d. p. g.?

A. Yes, the third sheet dated November 3rd, gives the preparation in detail. This shows that I prepared the diphenylguanidine in accordance with the standard text book methods. There are other methods. There are other methods probably equally

as good but this method has been given in the text books for a long time, and consists in heating thiocarbanilid with alocholic ammonia, in the presence of lead oxide. The substance was separated from the lead sulphide, re-crystalized from the alcohol and finally after several re-crystalizations came out in beautiful large flat needles which melted sharply at 147 degrees centigrade.

74. Q. State what the other cases of that exhibit are referred to?

A. The next page dated November 17, 1916 showed a preparation of diphenylcyandianid. As mentioned previously there are several methods of preparing diphenylguanidine but these two that I used are both well known and known to give fairly good results with regard with the yield that you obtain in your product.

The fifth page dated November 21, refers to the preparation of diphenylguanidine from diphenylcyanid and is apparently another method which was not entirely satisfactory.

75. Q. Did others at the Norwalk plant know about this work that you were doing?

A. Dr. Russell, did, yes, sir.

76. Q. He was fully informed?

A. He was fully informed at all times.

77. Q. Did he participate to any extent in the work?

A. I believe he did. I won't say in the actual work but he was associated with me in it throughout.

78. Q. You said he was your direct superior?

A. Yes, and it was not necessary for him to participate in it.

79. Q. But he had to know what you were doing, I suppose?

A. I mean that it was not necessary for him to do any of the actual laboratory work. That was left to me and he was familiar with what I was doing all the time.

80. Q. You left the Norwalk Company when?

A. On April 1, 1917 just almost three years to the day from the time I went there.

81. Q. And independently of the dates on this Exhibit "R" can you state from recollection just when this work was done?

A. I don't believe I understand the question.

82. Q. When was this work that you have recorded on this Exhibit "R" done?

A. It was done prior to the date shown here, October 31st. Inasmuch as these experiments had to be completed before they could be written up.

83. Q. What do the dates on these sheets, Exhibit "R" indicate?

A. They extend to October 31st, November 1st, November 3rd, November 17th and November 31st. For example the reason that they extend over such a long period is that the preparation of diphenylguanidine was under investigation at that time and you will note that after these results were obtained it was desired to find some easier and better method of preparing the diphenylguanidine. That was done subsequent to the original work.

84. Q. You made out each of those sheets; you wrote what is on each of the sheets of Exhibit "R"?

A. I wrote everything on these sheets.

85. Q. Including the dates?

A. Yes, sir.

86. Q. What do the several dates on the several sheets represent?

A. As I say they represent the dates at which the experiment was written up and that means that the experiment had been concluded or completed.

87. Q. At that time was the Norwalk Company engaged in the manufacture of rubber articles for general sale?

A. Yes, they were engaged in the manufacture of automobile tires and tubes, particularly tubes. We were not making at that particular date a great number of tires.

88. Q. Were they using accelerators at that time?

A. They were using large quantities of accelerators.

89. Q. Were you familiar with the use of accelerators, the method of using accelerators?

A. As I previously stated I was not only familiar with them but I actually prepared most of them that were used in the plant, along with the assistance of Dr. Russell.

90. Q. What I want to bring out is what the connection of yourself and Dr. Russell was with the actual manufacture that went on in the factory, the actual use of accelerators in the plant, in commercial work. Were you giving time and attention to that, or were you devoting all of your time to such experimental work as is represented by Exhibit "R"?

A. Well, I devoted as much of my time as possible to work of this character, but in a small plant such as we had there we could not by the very nature

of the organization pick out any one job and stick to it. We had to fit in where we were the most useful. That meant that to a certain extent I was working on the factory compounds as well as work of this character.

91. Q. Did your work in connection with the factory end require that you should be familiar with what was going on there and the practice that was followed, the way the accelerator was used, what accelerator was used and so forth?

A. Absolutely, yes, because as I have already stated Dr. Russell and myself were the only two there. When he was away—for example, while he was on his wedding trip I necessarily had to be able to take up the work where he left off.

92. Q. How is that work generally designated, that work of the chemist in a rubber manufacturing plant?

A. I don't understand the question.

93. Q. Do the chemists of a factory have any control over the methods of procedure in the manufacture of rubber?

A. Absolutely, yes.

94. Q. And was that control in the hands of yourself and of Dr. Russell?

A. Yes.

95. Q. That was what you were doing in connection with the chemical manufacture, and in addition to that you did this experimental work?

A. Yes.

96. Q. Now you say you left the Norwalk Company in April, 1917 and went with the Falls Rubber Company of Cuyahoga Falls, Ohio. What was your

position at that time. What position did you take with the Falls Company?

A. The Falls Rubber Company had been looking about for a chemist. They had not had any laboratory or chemical supervision whatever up until the time that I went with them. Someone had recommended me to Mr. O'Donnell, our president at that time and I came on from Norwalk and looked over the plant and made them an estimate as to where a laboratory could be placed and as to the probable cost of fitting out a laboratory capable of doing general factory control and experimental work. In addition I took up the subject of my own proposition when coming with the company and after about two weeks an arrangement was finally concluded and I left the Norwalk around the first of April, 1917. I stopped off in New York on the way back to Ohio and purchased or left an order for practically half of our laboratory equipment. When I went back to the Falls Rubber Company and ordered the necessary mills and presses and so forth and had the desks made and piping, and so on, and sometime later in June we had the laboratory installed, and I had it to a point by that time so I could get an assistant and have him working around in a more or less useful fashion. That however, covered quite a period of time, in building this laboratory and getting it into operation. I went to the Falls Rubber Company for that purpose and to act as chief chemist.

97. Q. So for a time you were the entire personnel of the chemical department and then you got one assistant?

A. Yes.

98. Q. Who was that?

A. Mr. Robert L. Moore of this city.

99. Q. Did he stay with you there any considerable time?

A. No, he came shortly after college let out. He graduated from college, I believe, in June, and he came with me and was there until sometime in September, I believe. Then he left to take a position with some rubber company.

100. Q. The Mr. Moore you refer to is Mr. Moore who testified in the national suit on this Weiss patent?

A. Yes.

101. Q. Who was the next addition to the personnel?

A. There was no next addition. Mr. Moore left in September, 1917 and shortly after that I was made general superintendent of the factory, which took me away from the laboratory until Mr. Flower came. Mr. Flower, however, would not come until December 15, 1917, approximately.

102. Q. Following your entry into the employment of the Falls Rubber Company what was the next thing that was done by you in connection with the use of guanidine derivatives?

A. The next thing was the preparation of the substance itself, and subsequently its use in experimental batches of inner tube stocks.

103. Q. Will you state fully the history of that, what you did and when you did it and for what purpose, and so forth?

A. We were not at that particular time in 1917 in a position to do as elaborate work as we had done at Norwalk—

By Mr. Kennnedy:

The witness was asked to say what he did, not what he didn't do, nor to explain why he didn't do it. I should think he should be compelled to reply directly to the question. I move to strike out his answer as far as given.

By the Court:

The witness should reply as nearly as he can to the direct inquiry as put.

A. The next step was the prepartion of diphenylguanidine in the laboratory by myself as Mr. Moore was without sufficient experience to be put upon work of that character. Later on it was desired to test those substances out in inner tube stocks and at that time we had a particular stock that we had made up hoping to obtain an order from a friend of mine who bought tubes in large quantities. In fact I had had considerable telephone conversations with him and the only thing that stood between us was price. The result was that we worked out a stock that met with his approval and on which we could make him a satisfactory price, and obtained an order for a thousand tubes which he needed at that time. We had this stock worked out in the laboratory and later on when the order was actually entered and while it was being mixed I saw to it that a portion of the D. P. G. which I had prepared in the laboratory was used in some of these tubes. I did not, however, have enough of the diphenylguanidine to use in all of the tubes. I used what I had and then left the formulae go through the factory in the regular way, in which it was finally allowed to remain there.

104. Q. This supply of diphenylguanidine that you had yourself made at the Falls plant before this order came up?

A. Yes. I wouldn't say how far before the order came up, but it was made prior to the order.

105. Q. State by whom this order was given, who was it bought these tubes?

A. The Rubber City Clearing House.

106. Q. That concern was run by whom?

A. Mr. Charles E. Williams.

107. Q. That is the man you referred to as a friend of yours?

A. Yes.

108. Q. And you yourself took the order?

A. I took the order, yes, sir.

109. Q. Did you have to report that order to anybody to get approval on it?

A. Yes. I took the order by telephone and wrote it up on our regular order memo. and that had to be O. K.'d for credit and subsequently billed out on our regular shipping order.

110. Q. Do you do something by way of referring it for credit?

A. My original pencil memo. was referred to Mr. M. J. O'Donnell our president and as I remember it he O. K.'d the order and it was then turned over to the billing department, who made out the formal copy and turned one copy over to the factory, I imagine and the other stayed in their own department.

11. Q. Now I understand that this order was for one thousand tubes and that in the manufacture of some portion of these D. P. G. was used as

an accelerator. I wish you would state in detail the steps that you went through leading up to the manufacture of these tubes and what you did and the sequence of events, and why you did it?

By Mr. Wooster:

I object to that question as the witness stated he did not manufacture the tubes. He said he saw to it that some accelerator previously made by him was put into the batches.

By Mr. Edmonds:

112. Q. Will you limit your answer to what you did or had done under your direct supervision?

A. You are speaking now with reference to the preparation of these particular tubes in the factory.

113. Q. Yes, and the work done by you that led up to the preparation of the tubes in the factory?

A. Well, I should do that first.

114. Q. Please do that first?

A. The work leading up to it was done in this way. As I mentioned a few moments ago we were bidding on this order for this particular gentleman and it was required to work out a formula that would meet with his approval as far as quality went, and at the same time permit us to make him a price that would be consistent with good business. We made up three compounds as I remember it in the laboratory one of which was selected for factory practice in case that we should get this order. These were recorded on a sheet of paper in a laboratory note book. The note book sheet, however, is not the sheet that was taken to the factory. That is not our

practice. At the Falls Rubber Company we have been in the habit of using note book sheets very similar to this Exhibit "R" on which we would write up our additional notes in reference to the experiments that are carried on. Some of those are failures and some of them are subsequently put into the factory. Those that are put into the factory are always written up on a separate card, with us. That is, we do not turn a sheet like this or like what was produced in the Aniline trial, over to the factory. That represents my personal laboratory notation of the record.

115. Q. This sheet that I hand you now is the sheet that you have just referred to as having been made up in the laboratory?

A. That is the laboratory sheet, yes, sir.

116. Q. Is that in your handwriting?

A. Yes, sir.

117. Q. When was that sheet prepared by you?

A. This sheet was prepared by me—that is it was written up on August 25, 1917 but as I have already said the work that was done there preceded the actual writing up of the results.

118. Q. Where has this sheet been after you were through with it at that time in 1917 and until it was gotten out for use in this accelerator litigation?

A. That was in the files of the Falls Rubber Company.

119. Q. It was gotten out for this purpose by whom?

A. I don't remember by whom. It was gotten out for this purpose. It was gotten out by myself

originally from the files and then turned over to yourself or Mr. Barrows.

By Mr. Edmonds:

The papers just referred to by the witness is offered in evidence as defendant's Exhibit "S".

By Mr. Edmonds:

120. Q. Now, will you continue with your answer to the previous question?

A. This record here is our laboratory record of the experiments that were carried on in the preparation of the general type tube stock that was used for these tubes which were sold to the Rubber City Clearing House. On here it is stated that No. 63—modified was called T-8. T-8 is a factory compound that was used, or was at that time but that has nothing to do with this particular sheet here. That is, we called No. 63-modified, T No. 8 but T-8 was written out on a separate card, and this particular sheet never left the laboratory, which in this case meant my own personal note book. You will note on this sheet that T-8—the form for it—is represented by No. 63 modified. That represents the formula which was put into the factory. You will also see a notation there with regards to No. 63, with a square around it and over to the side in pencil two notations "Lagos B-2.0;" another M or diphenylguanidine, 0.2. These refer to personal notations of myself with reference to the substitution of something else manylnose rubber, which was an accelerator we used at that time. The original formulae there had one portion of the manylnose rubber in it. I felt as though that one manylnose rubber equalled certain

amounts of other accelerators. This notation here with regard to Lagos represents the old factory name for thiocarbanilid. The M or diphenylguandine represent diphenylguanidine, and the diphenylguanidine is shown there on this pencil notation to be exactly one-tenth the amount of the thiocarbanilid. This ratio I should explain with thiocarbanilid is the amount to be used in tube stocks or in other stocks, is well known to all chemists and was known to me at that time and for a long time prior to it. When the tubes were actually made up in the factory they were made up—I am now speaking of the Williams tubes for the Rubber City Clearing House—they were made up under T No. 8 which you will see here is the same as No. 63 except that a portion of magnesia was removed and for it was substituted the diphenylguanidine that is, one had the diphenylguanidine that I had prepared myself and I substituted it for a portion of magnesia in the T-8 formulae. These compounds here as shown by this sheet, the laboratory sheet, I probably mixed those myself on the tubes that were prepared in the factory by the Rubber City Clearing House. I supervised that. I didn't actually mix the batch but I made the substitution, that is, instructed the man who did the weighing, whoever he might be, to simply weigh out a lesser portion of magnesia and I substituted the diphenylguanidine myself as long as it lasted. Then the T-8 stood as it originally was in the factory.

121. Q. Referring to this Exhibit "S" there are three formulas there which seem to be designated 62, 63 and 63-mod. Are we to understand that first formula was in use at all in commercial work?

A. No, I don't think that was used at all, the way this sheet shows. There is no notation with regard to No. 62. No. 63 was tried and was found to be more satisfactory than No. 62. No. 63 was then followed by No. 63-mod. or modified.

122. Q. 63 just as it stands, has one part of mannose. Was that an accelerator?

A. That was an accelerator, yes.

123. Q. And also had one part of magnesia. Was that an accelerator?

A. Yes. Magnesia is a very active accelerator particularly when used in connection with an organic accelerator. The two function together. I was familiar with that as is shown by my papers that are previously published, and I have actually applied in these tubes the same principles which I wrote of in some of these papers.

124. Q. Now the only difference is in 63 and 63-mod. just as they are written there is that 63-mod. has no mannose in it and it has three times as much magnesia?

A. That is right.

125. Q. Will you state again exactly what formulae was used in the manufacture of these tubes for the Rubber City Clearing House? That is state that by reference to these Nos. 63 and 63-mod. and the extent to which each was used?

A. The formula actually used in the factory for these tubes and subsequently for certain other tubes was No. 63-mod. which was called factory T-8. In the case of the Williams tubes, however, I substituted the magnesia with this ratio of d. p. g. as long as my d. p. g. lasted. That figured out in accordance with these figures here.

126. Q. Then in those tubes that were made which had the d. p. g. in you used .02 parts of d. p. g.?

A. Yes. It figures out on the ratio of .2 on the slab of rubber, and reclaimed rubber.

127. Q. That is .02 per cent.?

A. No, that is the weight. That is grams.

128. Q. .2 by weight?

A. Yes.

129. Q. When you used that .2 grams of d. p. g. did you use any magnesia?

A. Oh, yes, there was some used.

130. Q. How much?

A. I can't say as to that off hand. It will figure out probably using this figure, about one or one and a half.

131. Q. It would be one part, whatever percentage that represents?

A. I don't understand.

132. Q. One part of this total of 560; that is how much was the magnesia? The formula gives 63 and I understand you used a less amount of magnesia, when you used the d. p. g.?

A. Yes.

133. Q. How much less?

A. That would figure out about one part or one and a half parts.

134. Q. To what extent did your d. p. g. last. How many tubes were made with your d. p. g.?

A. I cannot answer that accurately, owing to the fact that I do not know exactly how much d. p. g. I had. I believe, however, that approximately 300 tubes would probably be as good an estimate as I could make. That is 300 out of the thousand that

were prepared for the Rubber City Clearing House. When that was exhausted the remainder of the tubes were made after formulae T-63 which in the factory was called T-8

135. Q. And that began when the suppiy of d. p. g. which you had was exhausted?

A. Yes.

136. Q. Can you tell how you arrive at this figure that you have written out here for thio, this figure of 2.0 for thio.?

A. We all knew how much thio it would take to obtain certain results and that is the reason why we knew approximately how much thio it would take, and my previous work had shown me that d. p. g. was ten times as strong as thio, so it was evident that if I should have to use two of thio, as I thought I would only have to use two-tenths of d. p. g.

137. Q. And the selection of two parts of thio. then was a matter of experience and judgment?

A. Absolutely, yes, sir.

138. Q. What is the document I now hand you?

A. This is the original memo. of the order that I made out for these tubes for the Rubber City Clearing House.

139. Q. In part that is your handwriting?

A. In part this is my handwriting, yes.

140. Q. Do you recognize the O. K. on there?

A. I do, yes, sir. That is the O. K. of our president, Mr. M. J. O'Donnell.

141. Q. Is that the O. K. for credit that you referred to awhile ago?

A. Yes. That was really in Mr. O'Donnell's

capacity. That should be a general O. K. for credit and shipment and everything else.

142. Q. That date September 4, 1917 was put on there by you?

A. Yes, sir.

143. Q. "Gray tubes" that was written by you?

A. Yes, sir.

144. Q. What are the two documents that I hand you?

A. According to our procedure at the factory at that time and to a certain extent today, orders given over the telephone or in person, other than a salesman, are taken down on a memo pad, of the same type that you have there. Those orders are then given to the necessary parties for O. K. and credit, or shipment of any kind and then when properly O. K.'d are turned over to our order department which makes out a formal shipping order of this character. These two orders, A-12546 and A-1284 are the shipping order formally issued after I turned in the properly O. K.'d memo.

145. Q. In one of the upper corners of this document 12546 appears "Memo Kratz." What does that mean?

A. That means that this order was formally issued on my memo which you have there.

146. Q. From where did these three papers come?

A. These three papers were produced from the files of the Falls Rubber Company at the time of the aniline case.

By Mr. Edmonds:

These three sheets referred to by the witness in connection with the sale of one thousand tubes to the Rubber City Clearing House are offered in evidence to be marked collectively Exhibit "T."

By Mr. Edmonds:

147. Q. Can you state what the paper that I now hand you is?

A. Yes. That represents the physical test results of a stock made up under the formula T-63 shown on the sheet that records my laboratory experiments.

148. Q. Is this another document from the files of the Falls Rubber Company?

A. It is.

By Mr. Edmonds:

The paper identified by the witness is offered in evidence as defendant's Exhibit "U."

By Mr. Edmonds:

149. Q. Do you know of your own knowledge whether or not these one thousand tubes were delivered?

A. Yes, sir. That is the tubes were actually shipped to this gentleman and sold by him.

150. Q. To the best of your knowledge and belief or to the extent of any knowledge that you have, were they satisfactory?

A. Yes, he so told me.

151. Q. Coming back for a minute to the manufacture of these tubes and the D. P. G. that was

used in certain of them, I understand you to say you put it there yourself, is that correct?

A. Yes. I put it there in this way. The only substance that was required to be altered in the T.-8 formula was the magnesia. The factory compound man made up this formula, put up the batch as we call it, in the regular way but I simply told him to put in a lesser amount of magnesia in these batches, and then added the D. P. G. to the mixture myself. On the factory batches, while I supervised them the actual work that I did consisted of putting the D. P. G. in the mixture.

152. Q. What I am getting at is this, who if anybody knew that you had put D. P. G. into that batch?

A. Not a soul, not a soul knew it. They simply knew that I was putting some white substance in there.

By Mr. Kennedy:

Why can't this witness answer the question asked. In every case he diverges from it and loses time that I assume is valuable. I move to strike out the last answer.

By the Court:

Go on. Of course declarations of others perhaps are not evidence of their particular knowledge. The actual fact that would be shown there would be that he did not disclose to any person the nature of the particular substance he was putting in.

By Mr. Edmonds:

The sole purpose is to let anyone who is interested know.

By Mr. Edmonds:

153. Q. There has been some discussion of a paper written by you in September, 1919. Will you state whether or not the document that I now hand you is a paper prepared by you and your associates and if so state when and where you presented that paper to the public, being Exhibit "E?"

A. This paper, Exhibit "E" was written by myself and Mr. Flower and Mr. Coolidge covering certain work that was done at the Falls Rubber Company, and put in the form of a paper and presented by me at the Philadelphia meeting of the American Chemical Society in September of 1919. Subsequently it was published in the journal of Industrial and Engineering Chemistry.

154. Q. You say it was presented. You read the paper before a meeting there in September, 1919?

A. Yes, sir, I did.

155. Q. There has been something said about posting some parts of this on the blackboard. What is your recollection in connection with that?

A. The tables of this paper were placed on a blackboard, to be used in presenting the paper and I put on as much of them as I could inasmuch as there were already some figures on the blackboard either for the past paper or the paper to come. The larger portion of the tables or the summaries were put on the blackboard.

156. Q. Specifically table 1 and table 2 on page 13, were they or parts of them put on the blackboard?

A. No. As I remember it both of those tables were on completely.

157. Q. What, if any, is the correspondence between tables 1 and 2 that I have just referred to, and the information on the second sheet of the Norwalk report, Exhibit "R"?

By Mr. Kennedy:

Objected to on the ground of indefiniteness. I don't know but maybe the witness knows what counsel means by "Information" when he asks for a comparison of the two tables. The tables speak for themselves.

By the Court:

The objection is overruled.

A. The tables show the relative accelerating action of the different substances when used for this purpose. In the case of the Norwalk work however, that is shown on the second page here, dated November 1st. That refers to work done with a mixture containing zinc oxide. The work shown in this paper was done with a mixture without zinc oxide. That does not seem to make any particular difference in the case of diphenylguanidine but did made a difference in the activity of some of the other accelerators such as thiocarbanilid.

158. Q. State what work you did in testing these accelerators covered by tables 1 and 2, without zinc oxide and when and where you did it?

A. This work here without zinc oxide as represented by the tables shown in Exhibit "E" were practically all done at the Falls Rubber Company and covered a considerable period of time. You will note that there are no physical tests in these

experiments and that the results were all carried on, as I previously outlined by vulcanizing slabs and using the thumb and tooth test, simply to check up that there were no unusual discrepancies between the use of zinc in the formula and without zinc in the formula.

159. Q. Will you state the circumstances under which you came to prepare and present this paper, Exhibit "E?"

A. This paper was prepared after attending a meeting of the American Chemical Society, in Cleveland where I read a paper with Mr. Flower on the vulcanization of rubber at a constant temperature and with a series of increasing temperatures. That meeting which was in the fall of 1918 was quite largely attended due chiefly to the announcement that there was to be a symposium on accelerators led by Mr. George Oenslager, of the Goodrich or Diamond Rubber Company. At this symposium when it was called we all expected to hear a great deal about accelerators and as the proceding went on there was absolutely nothing said. As a matter of fact everyone sat there waiting for someone else to talk. So I felt after that meeting that it was time someone should put some actual data on accelerators into a publication and I talked that over with Mr. Flower and we decided that we should put some of our information into the form of a paper to be presented at the next meeting of the American Chemical Society.

CROSS-EXAMINATION.

By Mr. Wooster:

X160. Q. How long have you been vice president of the Falls Rubber Company?

A. Since our last annual meeting in January.

X161. Q. You succeeded Mr. M. J. O'Donnell whom you mentioned?

A. No, sir. Under our present arrangement both Mr. M. J. O'Donnell and I are vice presidents, but Mr. O'Donnell is no longer active with the company other than as a director.

X162. Q. You referred to naphthylguanidine. What kind of a substance is that?

A. Dipnaphthylguanidine.

X163. Q. Is that tri-substituted or a di-substituted, or a mono-substituted or a tetra-substituted guanidine?

A. I couldn't say, sir.

X164. Q. Coming to the tubes at the Falls Rubber Company can you recall any other formulas which were in use in the factory at the time you were there? Not the contents of the formulas but the factory names of them similar to the one you mentioned as T-8?

A. Yes, I can recall them because I named them.

X165. Q. Will you give some of the other names?

A. Well, there was T-3; T-4; T-5; I believe T-6 and T-15.

X166. Q. When did T-8 become a factory compound?

A. T-8 became a factory compound some time

in September, 1917. Please understand that that refers to a compound like T-8 where it was used on special or private brand orders, as this order was for a thousand tubes. That formula is not necessarily in use from day to day, like our tread stock.

X167. Q. Was T-8 formula only used for special orders or was it a standard gray tube formula that was used right along?

A. As I remember it we didn't make any grey tubes in those days. We made only red and green.

X168. Q. You had other code names for red and green tube formulas?

A. No. There was for example T-5 and 6. For red tubes. The code name would not indicate the color of the tube.

X169. Q. Was T-15 for a green tube?

A. Yes.

X170. Q. Why not T-8 for a grey tube?

A. T-8 was a grey tube.

X171. Q. But you say it was only a grey tube made for a special order?

A. No, I said we were making only red and green tubes in the factory at that time. In fact it was only within the last few years that we have made any great drive on grey tubes. This man wanted a grey tube.

X172. Q. He was the first man that had wanted grey tubes, is that right?

A. No, by no means.

X173. Q. Was he the first man to whom you sold grey tubes?

A. I couldn't say as to that.

X174. Q. Is it not your best recollection that you had sold grey tubes previous to taking this order from the Williams concern?

A. I don't understand your question. You mean had we ever sold grey tubes before.

X175. Q. Yes.

A. Most assuredly yes, but when I came to the Falls Rubber Company, in April, 1917 their tube department was shut down. Their tubes had been unsatisfactory and they decided they would not make any more tubes until they had one that was right. That was part of my duties in going there.

X176. Q. Does this mean green tubes or red tubes or grey tubes or all three?

A. All three. They made no tubes when I went there in 1917, in April.

X177. Q. But they had the equipment to make them?

A. They had part of the equipment.

X178. Q. What part didn't they have?

A. They didn't have the necessary splicing mandrels, nor the right size mandrels on which to make the tubes. In fact all of the equipment was old and obsolete and one of my first duties was to order new equipment.

X179. Q. But it was possible with the equipment you found there when you went to make tubes, was it not?

A. They had done it but the tubes were not satisfactory.

X180. Q. Were the tubes unsatisfactory because of the equipment or because of improper compounds?

A. I have no idea. That was before my time.

X181. Q. What did you do with tubes after you got there? What was the first thing you did?

A. The first thing I did was, of course, to bring our equipment up to date and procure the right size mandrels, splicing mandrels, and we arranged the room and so on. Then I brought out a red tube which was sold to some extent although naturally not having been in production for sometime our sales on tubes, at least, were not large. Shortly after we got into the manufacture of tubes I brought out the Evergreen tube, which particularly appealed to our president, Mr. O'Donnell, and later on we specialized in that tube in the Evergreen, and we do to this day.

X182. Q. Do you recall when the Evergreen came out?

A. You mean when the first Evergreen tube was made?

X183. Q. When it was first marketed?

A. I have copies of the first advertisement describing it.

X184. Q. What is your best recollection?

A. I wouldn't have any recollection.

X185. Q. Will you explain how a tube is made, the various operations?

A. All the way through?

X186. Q. Yes.

A. Starting back with the raw rubber, the rubber and the different ingredients are usually kept in separate rooms under the supervision of a man we call a compound man. These ingredients are weighed out in ordinary practice. What we did at Falls was to bring our rubber into our compound room where

we have two or three men who tear down the rubber. By tearing it down I mean that the rubber is in sheets closely pressed together. These have to be torn apart. Then we have always held them up to the light for inspection. This means that we have two or three men engaged in that work. We also have one man who is engaged in sifting pigments, a machine I built about that time, 1917 or had built for me for the sifting of the pigments such as zinc oxide and so on to keep the splinters from getting into the stock. There is also a man to weigh out the different substances and a man to assist him. In the compounding room—I cannot say definitely what it was in 1917 but there must have been at least three to five men working in that room. Today we have possibly ten to fifteen men. The batches are put up in this fashion, that is, after the materials are brought to the man who does the weighing he weighs them out and puts them in a pan or bin where it is carried to the mill on which it is mixed. The rubber is put on there and is allowed to soften and the different pigments are put into it from time to time as fast as they can without dropping through. After the stock is all mixed up in that fashion it goes to the calendar, and is sheeted out in the proper form, a flat sheet, from which it goes to the tube room and is cut up into flat pieces of stock which are rolled around a mandrel, vulcanized The end of the mandrel is spliced, a valve inserted and so on.

X187. Q. Is this cure of tubes wrapped on a mandrel, what people call an open cure or what has been previously referred to as a press cure? If it is an open cure will you describe it?

A. It is an open steam cure. It is a case where you simply take a piece of rubber and wrap it around a hollow mandrel and then wrap the rubber after it is rolled up, wrap it down with a wet rag, which gives a certain amount of pressure, and it is put into a vulcanizer and live steam.

RECESS.

AFTERNOON SESSION.

Tuesday, October 13, 1925.

G. D. KRATZ, recalled, testified as follows:

CROSS-EXAMINATION (Continued).

By Mr. Wooster:

X188. Q. At the time of recess you were explaining the progress of tubes through the plant, and had, as I recall, just stated that the tubes were cured in open steam after being wrapped in cloth. How many men did this?

A. That would take a number of men. I don't believe I could say offhand. It would take a man to roll the tubes on the mandrel, and another man to wrap them, and two or three more men to put them in the vulcanizer, the man who took them off the pole and a man to splice them. There would be several operations—there would be a number of operations all the way through.

X189. Q. After the tubes were stripped off the mandrel they were then turned inside out to bring

the cloth marks inside, and then spliced, giving the smooth outside appearance to the tube?

A. That is the way we have always cured tubes.

X190. Q. Well, that is the customary way, isn't it?

A. That is customary, with one or two exceptions—in those days.

X191. Q. What then happened to the tubes after they were spliced?

A. After they were spliced they were inspected and put up in the regular box to ship out, in the regular way.

X192. Q. And when were the valves put in?

A. The valves were put in—I couldn't say at that particular time when the valve was put in. At present we put the valve in just before splicing the tube.

X193. Q. Now this is the general procedure that was followed with those tubes made on the 63 formula, is it?

A. Well, it is the general procedure followed for making of tubes made under T-8, which was based on the 63 formula, yes sir.

X194. Q. I mean, there was no special variation in the regular procedure in filling this order for Rubber City Clearing House, was there?

A. Only the addition of the D. P. G. to the mixture by myself at the time it went on the mill. That was the only part I played in this all the way through, in the factory.

X195. Q. You said there were one or two men that did the milling?

A. No, only one man did the milling.

X196. Q. Who was he, doing the milling when you put this D. P. G. into the batch?

A. I would have no idea as to who that might be. We employed anyone who was an experienced mill man. At that time we had quite a few foreigners. You see, we have five mills.

X197. Q. All in one room?

A. No, sir.

X198. Q. Which room was this Rubber City Clearing House order made in?

A. Well, all tube stocks and finished stocks that are subject to discoloration are milled in our regular mill room. You take stocks that contain a large percentage of gas black, like tread stocks, they have to be prepared in a special room. We had such a room at that time as I remember.

X199. Q. Will you state just in which room this order for Rubber City Clearing House was milled?

A. I guess it was milled in our regular mill room—not the basement, but the mill room.

X200. Q. That was the room where you milled tread stocks and other tube stocks?

A. Not tread stocks, no, sir.

X201. Q. Where you milled only tube stocks?

A. No, where we milled virtually everything except tread stocks and bead stocks.

X202. Q. The same room where you made the evergreen tubes?

A. Yes, sir.

X203. Q. The same room where you made the red tubes?

A. Yes, sir.

X204. Q. And will you give the names of the men who were present when you put this D. P. G. into the batch?

A. I can't do that because they were just our factory workmen, and it will be impossible for me to say that any of them are still in our employ—at least in the mill room.

X205. Q. Will you give the names of the men who were employed in this room at the time you say you put this D. P. G. into the tube batch?

A. I couldn't very well do that because many of them are foreign names, that I probably didn't know except by Bill or Mike or Steve, some name like that.

X206. Q. Can you give the name of the man you said was the compounder at this time?

A. Well, as I remember it, we had possibly two or three employed in the compound room, and as I previously stated, in that room in connection with the putting up of batches there were possibly five men. The only one I can remember off hand of being employed there was Paul Shaw, and I don't remember him as being employed there for all of this time.

X207. Q. You mean the Mr. Paul Shaw who is here present?

A. I do, yes, sir.

X208. Q. What was his position?

A. His position was compound man, I guess you would call him.

X209. Q. Did the compound man have charge of the raw materials, and was he held responsible to the management for what became of them?

A. For the raw materials?

X210. Q. Yes, the raw rubber and other materials that went into the batch?

A. Certainly not.

X211. Q. Well, who was responsible for the stock—what you might call the stock clerk?

A. If you speak of raw materials, the stores man, stores keeper—or in our case, he is a joint—he has a joint capacity of store keeper and receiving room clerk.

X212. Q. Well, who was he at this time?

A. That I would have no idea.

X213. Q. Well, whose job was it to get the necessary materials from this storekeeper in order to fill this Rubber City Clearing House order?

A. Well, whoever was in the compound room could get the necessary materials from the storekeeper by ordinary requisition—that is, any signed requisition for materials, raw rubber, zinc oxide, any other material, on being taken over to the store keeper was evidence that it could be delivered to the person that presented the order.

X214. Q. You did not yourself go personally to the storekeeper and get the materials for this Rubber City Clearing House order, did you?

A. I would certainly think not.

X215. Q. Well, did you make out any requisition or other paper by which anybody else could have gotten the materials from the store keeper?

A. Did I personally?

X216. Q. Yes.

A. I wouldn't think so. Any order for the Rubber City Clearing House or anyone else should go

through in the regular way, and that did not require a special order from me.

X217. Q. The regular way was to put orders through without anything from you, was it not?

A. As far as the regular operations of putting an order through, I was not concerned in that. The only thing I was concerned in was the nature of the materials that went into the order, that is, if I wished to alter a certain formula, that was my privilege. As an example—and one that is frequently in use, or was in those days—you run out of one type of rubber, and you substitute another rubber for it. That is absolutely up to the chemist, whoever he is.

X218. Q. Is that not up to the compounder?

A. Absolutely not, no, sir.

X219. Q. Can't the compounder substitute crepe or smoked sheet for each other?

A. Unless he has instructions from the chief chemist he is absolutely violating our rules.

X220. Q. Who would have made out the requisition for materials to fill this Rubber City Clearing House order?

A. I don't see how anybody would have made it out. When putting through a requisition for materials for raw rubber, for example, it would be put through for a ton, or whatever quantity would go on the right kind of truck to haul it away from the store room and that rubber would be used on whatever orders would go through the factory at that particular time. If it happened to be green tubes, part of it might be used in that, and the balance in gray tubes or red tubes, or tires. I don't see how there could

be any possible traces of the Rubber City order or any other order that has gone through our factory.

X221. Q. But you say you took by telephone an order from Rubber City Clearing House for 1000 tubes of assorted sizes, these to be gray tubes, at a special price. Now, what was the next thing that happened on that order, and who did it?

A. Well, all that was necessary there was to put the results of the experimental work, as shown on one of those sheets this morning—put the 62 or 63 or 63 Modified experiments on it, convert those experimental results into a form that could be turned over to the factory, and give it to the compound man, or whoever was in charge of the work, to put up the batch. He put it up, he didn't know whether it was going in the Rubber City Clearing House or going in the Falls Tire; if he did he got it from other outside sources.

X222. Q. But you have not yet said who made out the requisition?

A. I have already said there could not have been any requisition for materials for that order—which is the way I understood your question.

X223. Q. You mean the compound man got something from you—

A. He got a card.

X224. Q. In the way of a formula?

A. Yes, sir.

X225. Q. And then he told the storekeeper to give him some rubber, and brown sub, and blank fixe and mannose R, No. 40, and magnesia, and the store house man did it. Is that right?

A. If he was short in those substances that you

mention from his own room, yes, he got that from the storekeeper, but he would have the greater portion of those things—of the different substances right in his own compound room. That is why I say you can't trace any particular order.

X226. Q. And the compound man kept no record of what he used up out of his own stores, nor charged those things against particular orders. Is that right?

A. I can't say as to the compound room man charging or being held responsible there. I don't believe that was his capacity. We have always held the stores man responsible for deliveries.

X227. Q. But you figured out the cost of these tubes, and how could you do it until you knew just how much of each ingredient was used?

A. I knew that from my laboratory experiments.

X228. Q. What was the total weight of these tubes furnished on the Rubber City Clearing House order?

A. The total weight of the tubes themselves furnished on the order?

X229. Q. Yes.

A. I couldn't say as to that. Probably it was —a thousand tubes of assorted sizes, somewhere around 1500 pounds.

X230. Q. 1500 to 2000 pounds?

A. Possibly, yes.

X231. Q. And you haven't a single record of where more or less a ton of material came from to fill that order, have you?

A. We certainly have, but I would't see where that would be in the compound room. I am saying

that the record was kept by the stores man. It was a case of charging it out rather than charging it back. We keep a perpetual inventory in our stores. Whenever the stores man gets in a car load of rubber, he weighs it up. When the compound man comes to him and takes a truckful of the rubber away, the rubber is weighed and deducted from our perpetual inventory and charged against compound.

X232. Q. How could the stores man, according to that system, have any record of what actually went into this Rubber City Clearing House order, and how much it cost?

A. Well, the stores man is not concerned with how much the Rubber City Clearing House order cost. We know for example that our rubber for the month of September, 1917, or September, 1925, costs us so much. That rubber—the average is turned over to whoever has occasion to use it, such as your chemist, your compound man, your tire construction man. He employs that cost for the month of September. If the average cost of our rubber in October is greater or less than that amount, he revises his figures accordingly.

X223. Q. From that do I understand that the costs given on columns No. 62, No. 63 and No. 63 Modified are simply estimates of monthly costs for that month?

A. Well, they are the batch costs. For example, —I have forgotten the cost of rubber at that particular time, but it was somewhere between 50 and 60 cents a pound. We knew exactly how much our average cost of the different ingredients was at that par-

ticular time. Those were supplied to me in the laboratory by our purchasing agent. They were also supplied to our cost man. So far as I know we were the only two that were interested in them. I was only interested in them to the extent of making up a compound here which would permit us to bid against somebody else and obtain the order from the Rubber City Clearing House. They had previously bought these tubes from someone else.

X234. Q. Well, your pencil memorandum of September 4, 1917, says: "Price 50 plus 5 percent Miller list." Will you explain what that is?

A. Isn't that 50 minus 5—or 50 and 5?

235. Q. It is 50 and 5, exhibit T, National record, page 502.

A. This price 50 and 5 percent off Miller list, that meant that the price at which this order was taken was at a discount of 50 and 5 percent off of the current list of the Miller Rubber Company. We had been asked to make tubes—rather I had solicited his tubes. He said that he would be willing to give us a preference provided we could give a tube equal in appearance to what he was buying and at approximately the same price. I had duplicated the tube to all external appearances, to satisfy him. The tube that was furnished against this order was equal to or better than the tube that he had been buying, as judged by external appearances, and in accordance with his estimate of quality.

By Mr. Wooster:

I move to strike that answer out as irresponsive and volunteered. My question simply related to the price.

By the Court :

It seems to me you are taking altogether too much time with this phase of it—as I understand the particular purpose, because after all you are going to come squarely up against the original proposition to the effect that he imparted to no one particular person the stuff he put in the compound.

By Mr. Edmonds:

But the answer is not irresponsive. It was a direct answer to the question asked him.

By the Court:

Well, I will not strike it out. As I understand—the question of time is the thing that was worrying me, and it seems to be out of proportion, the matter of time being taken up.

By Mr. Wooster:

I would like to say this is really the crux of the case, and we deem it most important that this transaction as given by this witness this morning be very fully disclosed here.

By the Court:

Well, you are going over the thing and repeating, after the same question has been put. Go ahead however.

X236. Q. Referring now to formula 63, I understood you to say this morning that Mannose R was an organic accelerator, is that right?

A. That is right.

X237. Q. Was that hexamethylenetetramine?

A. I would't care to commit myself in that respect, inasmuch as we are still using the substance.

X238. Q. Do you know what it was?

A. I believe I do, yes.

X239. Q. You will not say it was hexamethylenetetramine?

A. No. As I say, I wouldn't care to commit myself, inasmuch as we are still using that substance, practically.

X240. Q. Was it all accelerator, or a mixture of rubber and accelerator, what is sometimes called a master batch?

A. It was a master batch.

X241. Q. What connects this formula No. 63 with the pencil order you took, dated September 4, 1917?

A. Nothing, except as I just explained—this tube was in anticipation of this very type of order we were getting, on price. This tube was designed to meet the very emergency presented by this order.

X242. Q. Yes, but the price of No. 63 is the same as the price of 63 Modified?

A. That is right. As a matter of fact, 62, 63 and 63 Modified are all so close in price that, so far as it was concerned, any one of the three could have been used on this order.

X243. Q. Exactly. Now what connects this order with the substitution you stated this morning in No. 63?

A. That question isn't clear.

X244. Q. You said this morning that you substituted diphenylguanidine in formula 63 for mannose R. I now ask what connects that substitution, if and

when you made it, with this Rubber City Clearing House order of September 4, 1917?

A. Well, as explained this morning, I knew the relative activity of mannose R, lagos P, and diphenylguanidine. To me any one of those three substances was interchangeable in the quantity shown, but I wanted to try the diphenylguanidine in practice. That was the reason that substitution was made.

X245. Q. And that is the substitution that you told no one about, isn't it?

A. Yes, sir. I had no one to tell.

X246. Q. What enables you to say that you used .2 parts of diphig instead of M. or monophenylguanidine?

A. Well, I have never been able to have any great quantity of monophenylguanidine. In fact, it is, as I remember it, more difficult to prepare, and get pure.

X247. Q. Is there anything in this entry referring to lagos P. and M. or diphig, which shows which of these three materials was actually substituted?

A. No, I wouldn't think so.

X248. Q. That is, you can't tell from this entry on the sheet which was actually substituted?

A. No. These are my personal notations there —you couldn't.

X249. Q. And the square in column 63 opposite mannose R is the only thing that tells you in which of the three formulas the substitution was made. Is that right?

A. Well, that is virtually right, yes. But you will note that 63 and 63 Modified are identical, with

the exception of the mannose and the magnesia. Now, substituting anything else for mannose will substitute —or will result in substituting a lesser or larger amount of magnesia. No. 63 and No. 63 Modified, to my way of thinking, as a chemist, represent the same formula. It is simply a modification of the formula in connection with the accelerator used.

X250. Q. To put it in my language, the one part of magnesia and the one part of mannose R in No. 63 equal or replace the three parts of magnesia in No. 63 Modified?

A. That was what I believed.

X251. Q. Is that it?

A. That was what I believed, but apparently it was not true. You will note at the bottom of that page it says, "No. 63 bloomed out well on even 60 by 40 cure." In other words, that compound was probably undercured.

X252. Q. You mean No. 63 was probably undercured?

A. Yes, sir. No. 63 as it stands there. That is, with the mannose R in it. I make that statement because the tube formulas—or the tubes cured in open steam were cured at 35 minutes by 40 pounds.

X253. Q. Did you say this morning which of formulas 63 and 63 Modified the substitution occurred in?

A. Well, as I just stated a few moments ago, to my way of reasoning, as a chemist, 63 and 63 Modified are the same formula. In substituting D. P. G. for mannose R, I necessarily had to alter the amount of magnesia. Those are the only two variants in those two formulas. There is another point that possibly

should be brought out and that is that in converting this in the factory on a hundred pound batch, such as I described previously, you cannot always transpose figures like 3 and 5 on 560 total mass,—it is difficult to transpose those exactly to pounds and ounces.

X254. Q. It is still not clear to me whether in the tubes of the Rubber City Clearing House you used three parts of magnesia, as in No. 63 Modified, or one part, as in No. 63, together with D. P. G.

A. Well, it would figure out one part plus the D. P. G. Then when the D. P. G. was exhausted it was necessary to go back to three of magnesia, and that formula did not give us good results as with the D. P. G.

X255. Q. Well, when you went back to the three magnesia, that became No. 63 modified, didn't it?

A. That is right.

X256. Q. And that was the T-8 factory formula, wasn't it?

A. Yes,—because I had no more D. P. G.

X257. Q. You said you put the D. P. G. into this batch in the mill room. Did you put it in all at once, or how did you put it in?

A. No. In trying out anything like that, which I did on a number of occasions, not only with D. P. G., but with other substances, any of which are dry powders, they were taken and put on a piece of paper, in this fashion (ind.), and spread along here if this was the revolving roll, with the rubber going around it,—it was held this way (ind.), with the paper slightly inclined, and that gradually absorbed the material that you were putting into the stock, that is, the vi-

bration of the roll knocked the material off the paper. Of course, here I am working down with exceedingly small quantities, as I find in my papers. We were interested in small quantities, and it took a great deal of care in getting that into the rubber.

X258. Q. How much D. P. G. did you have to work with?

A. It was somewhere around 30 grams.

X259. Q. 20 to 30, as you said in the National case?

A. Well, as I said there, I couldn't commit myself on that. At that particular time they presented me with a small bottle, which seemed to have about the same amount that I have. But I couldn't commit myself definitely as to the amount of D. P. G. I had.

X260. Q. Well, you took that amount and dumped that on a piece of paper, and then sifted it onto the rubber?

A. No. I would have had there enough to have made more than one batch.

X261. Q. How many batches did you sift D. P. G. into?

A. Well, it would have meant sifting it into two or three batches.

X262. Q. Well, can you state just how many you did sift it into?

A. I would say at least two batches.

X263. Q. And how much compound was in each batch?

A. That would be about—well, there would be exactly 100 pounds.

X264. Q. And how much D. P. G. did you weigh into each batch?

A. Well, I haven't got that figure—the exact figure, but it would be a very small amount, a quarter or half an ounce per hundred pounds of rubber.

X265. Q. So you really divided the amount of D. P. G. into the two, and put that equally into two batches, is that what you did?

A. Yes, until my D. P. G. was all used up.

X266. Q. Well, did the amount you had just come out even?

A. I couldn't say as to that.

X267. Q. Do you now say that you may have had enough D. P. G. left over for part of a third or a succeeding batch?

A. Well, any amount of D. P. G. that would have been left over would not have been enough for a batch, or I would have used it in a batch. It would have been enough for some laboratory tests, but not tubes.

X268. Q. Well, take the succeeding batches, where you did not sift in the D. P G., did you put in the increased amount of magnesia yourself?

A. No. That formula was left right in the compound room after I made these substitutions of D. P. G. for the magnesia. I simply told the compound man, whoever he might have been—I don't remember as to that—to simply cut down the magnesia in these particular batches and I sifted the D. P. G. into those batches. When those batches were prepared, the card called T-8 was left in the factory until such time as it was changed again, which it was.

X269. Q. What is the reason you don't want to state what mannose R was?

A. Well, as I say, it is not customary for us to disclose the nature of any of the substances of that character that we are using in factory practice.

X270. Q. What about No. 40?

A. No. 40?

X271. Q. Yes.

A. What do you mean—what about it?

X272. Q. What was that?

A. What was it—it was gas black.

X273. Q. In this morning's testimony you referred to your table 1 in your paper, in your Norwalk experiments, as giving the same effect. Will you explain what you mean by "effect"—the different accelerators mentioned, you said, gave the same effect if used in varying quantities. Will you explain what you meant by the "same effect"?

A. I have forgotten with what I was comparing it. Was I comparing the publication with the Norwalk figures?

X274. Q. No, you used the same term in both. For example, in the National record, at page 37, you said: "That is, to determine how much of each one of these was required to give the same effect as three and one-half percent of anilin." This morning you used a similar expression. I am asking what you mean by "same effect".

A. By "same effect" I mean that in preparing slabs of rubber with anilin as the accelerator, it will give you a certain toughness or stiffness, or certain other properties, in that slab, that you can determine either roughly, by physical test with your thumb and tooth, or more accurately on a testing machine. The idea of that was to see how much of the other sub-

stances—D. P. G. and so on—would be required to give the same strength and elasticity—in other words, make the same type of compound with, as we call it, the accelerating effect. Now that term is a misnomer, inasmuch as certain accelerators like D. P. G. will toughen up your compound more than anilin, and really do not vulcanize the compound to the same effect as some other substances, but you estimate it as the same effect.

X275. Q. Then what you mean by "same effect" is nothing very tangible, is it?

A. I don't know how you could get anything more tangible.

X276. Q. Well, you can tell by thumb and tooth, and it may be the same or not, but it gives you the same impression?

A. Gives you the same physical strength.

X277. Q. I see I have omitted two questions about the tubes of the Falls Rubber Company which I would like to ask you now. One is: In the National record, at page 53, you said in speaking of diphenylguanidine, "I had a small quantity of it, and I put it in there and made it up into tubes," did you not?

A. Well, if you mean, did I make it—

X278. Q. No, I just asked you if you made that statement. I am going to give you a chance to explain. You did make that statement?

A. Oh, yes, sure, I made the statement.

X279. Q. I understand from what you have said today that all you really mean by "making that up into tubes" was that you sifted the D. P. G. as far as it went into batches on the rolls and then had nothing more to do with it. Is that right?

A. That is right, as far as that particular operation goes. Of course, I was supervisor of the mill work in connection with my other duties. If you mean, did I actually mix the batch,—no, I did not.

X280. Q. Well, now, what was the last time you saw the batch in which the D. P. G. went—immediately after it went in, or did you follow it further?

A. Well, the way we follow things—

X281. Q. I mean you personally.

A. I personally followed it farther than that, in accordance with the practice then in vogue, and which we still use, namely tagging that particular batch with a red tag, marking it, and having the calendar man who runs the tubes mark his rolls of stock made from that, and when the tubes are made up in the tube room the tag follows through, and the tube room man also tags his tubes, and then they were returned to my office. That procedure is still in use. I was only interested in a few of those tubes, to note their appearance and so on. The rest went into the regular stock—or rather into the regular completion of that order.

X282. Q. Did you say in your last answer that the D. P. G. batches were differently tagged than the other batches?

A. That would be right, yes, sir.

X283. Q. You personally saw that?

A. I couldn't say that I personally saw it. I personally gave instructions to that effect.

X284. Q. Well, how far from this point did you follow these two different mixtures that were sold later as tubes to Rubber City Clearing House?

A. Well, after the tubes were once mixed, and the D. P. G. in them, that is, in the stock, I was not particularly interested until the tagged tubes were returned to my office. I had no occasion to be interested.

X285. Q. Was there any different marking on one kind of tube than on the other—label or stencil or anything like that?

A. Absolutely not, except the ones that were sent back to me were accompanied by the red tag.

X286. Q. So that the one who got the tube would not know which was which, would he?

A. Absolutely not; unless the quality was such that he could tell by the feel of it.

X278. Q. Where you changed the batches, some having D. P. G. and some not, did not that necessitate a separation of these batches in calendering?

A. Yes, it should. The stocks were run out, but what we would call the tailings were mixed in with the aggregate of the other stock, that is, there was no effort made to keep the two stocks separate. That might have resulted in a greater acceleration of the other tubes, the regular T-8, than there otherwise should have been, because the D. P. G. would have gone through not 300 tubes, but through virtually a thousand tubes.

X288. Q. Yes, but should not the calendering man have commenced with the red tag to differentiate the D. P. G. batches from the regular T-8 batches?

A. No, because the batches were tagged when they went to the calender man. The mill man does the tagging.

X289. Q. The mill man does the tagging. You don't remember who that mill man was?

A. No, I wouldn't remember.

X290. Q. It might have been one of a half dozen persons there?

A. Well, we had five men—five men milling rubber at that time, and my recollection is we had five mills.

X291. Q. The figures as given by you in your Norwalk tests, and in table 1 of your paper generally agree, do they not?

A. They agree very, very closely—in fact, the tests in the paper were made just simply to confirm the Norwalk tests, and undoubtedly I was to a certain extent guided by my previous tests.

X292. Q. Well, I mean, in the paper as printed, you use one part of anilin, say, to .075 of D. P. G., and in the Norwalk test you use three and one-half of anilin to about .25 of D. P. G., do you not? So the ratio is—

A. Is virtually the same.

X293. Q. So isn't one just three and a half times the other?

A. The ratio of D. P. G. and anilin in the Norwalk work and the relation of D. P. G. and anilin in the work published is the same, virtually the same. That applies to all of them, with the possible exception of thiourea or urea, in which I have got some discrepancies in my results.

X294. Q. Is that your same opinion now, as it was then, as to these relative ratios?

A. It is on that method of testing, I would say, yes. I don't know as I would agree now, in view of

later work done the same way, that that would be the way to test them.

X295. Q. Well, you used two methods of testing. In Norwalk experiments you seemed to have had zinc present, whereas in the paper you did not, yet you seemed to get the same general ratios between these various substances, ranging from thio., including triphenylguanidine and diphenylguanidines. It that still your opinion?

A. Well, you are not considering one statement I have previously made, that certain substances, such as diphenylguanidine, toughen the stock in the way that misleads you. If I were repeating those experiments today, I would determine the actual amount of combined sulphur, and to my way of thinking, get it more accurately than I did at that time.

X296. Q. You mean, that the amount of combined sulphur is a better index of what you mean by "same effect" than any other tests that you know of?

A. Well, I am not up to date on the latest methods of testing rubber, but I think that the combined sulphur gives you a better estimate of the accelerating effect of the material. Now, I don't mean by that what I have previously spoken of as accelerating activity", which included physical properties and that sort of thing. I am speaking just strictly of the accelerator as an agent to promote the combination between rubber and sulphur.

X297. Q. Well, the term used for that today is sulphur co-efficient, is it not?

A. Yes. You mean, "sulphur co-efficient" as an expression of the combined sulphur and the rubber, its ratio?

X298. Q. Well, whatever it means.

A. Yes.

X299. Q. Is that the term in common use in preference to "combined sulphur", or do you go by "combined sulphur"?

A. No; "combined sulphur" would not mean much if your compound contains zinc, because you would figuring in the zinc, which was equal to the weight of your rubber, so you would only be getting —or you would be figuring your sulphur on a weight which is twice as much as it should be.

X300. Q. Well, suppose I take a lot of zinc gum stock, how do I tell what is a good stock—by sulphur co-efficient or combined sulphur or thumb and tooth test, or what?

A. You should consider all of them. And as I understand modern practice, they go in for a more elaborate method of testing, which they call stress-strain curves. I am not completely familiar with that method of testing.

X301. Q. In 1916 what equipment for testing physical qualities of rubber did the Norwalk company have?

A. We had—I couldn't say whether we had a Scott testing machine in 1916 or not. I believe we had though. That was the only machine that we would have for testing rubber, other than the thumb and tooth method, which I employed.

X302. Q. You made sulphur determinations at that time?

A. At Norwalk?

X303. Q. Yes.

A. We were not equipped to run elaborate sulphur determinations.

X304. Q. Well, did you make any?

A. Did we make any—on any stock, or on these particular stocks.

X305. Q. On accelerator stocks?

A. On accelerator stocks we certainly did, yes, sir.

X306. Q. And you formed your conclusions as to the value of accelerators by these sulphur determinations?

A. No, sir. If you will refer to one of the papers I published, you will find that in that paper I mentioned specifically that the sulphur co-efficient of an accelerated stock was not the correct indication of the proper cure as we understood it.

X307. Q. Is that your 1921 paper?

A. I wouldn't say as to that. It was in one of the papers though.

X308. Q. Well, later than the Exhibit E paper?

A. I couldn't say as to that.

X309. Q. I have here a paper in the "India Rubber World" of July, 1921, pages 744-745, and entitled "Action of certain organic accelerators in the vulcanization of rubber—III", by yourself and Mr. Flower and Mr. Shapiro. Is that the paper you mean?

A. I believe I had emphasized this statement considerably before this paper—I was going to say in a paper published in the "India Rubber Review" of 1916. That paper included accelerated stock, and I believe that statement was made there.

X310. Q. So that the opinions expressed in your

1916 and your 1921 papers are your opinions still, are they?

A. Well, I am not sure that that opinion was expressed in the 1916 paper. I am just quoting from memory there.

X311. Q. I mean, have you changed your opinion as expressed in the papers you have published?

A. Well, I am afraid I am a back number on publications now. I have been out of this work for over five years.

X312.Q. Well, at the time you published these several papers, did they correctly express your opinions at that time?

A. They certainly expressed our opinion, as we understood the subject which we were investigating.

X313. Q. Subsequent to the sale of tubes by Falls to Rubber City Clearing House, did the Falls Company, to your knowledge, use diphenylguanidine in any of its factory compounds?

A. Was your question how soon or did they?

X314. Q. (Question read.)

A. Yes. After these tubes—the Rubber City Clearing House tubes, after those tubes had been made, we used diphenylguanidine in the factory as soon as we could obtain it on a commercial scale.

X315. Q. When was that?

A. I couldn't say as to that.

X316. Q. From whom did you first obtain it, if you recall?

A. I don't remember that. Mr. Flower was in charge of the laboratory at that time.

By Mr. Wooster:

The paper from the India Rubber World, July, 1921, I would like to have marked for identification Plaintiff's Exhibit 11.

X317. Q. In your paper of April, 1920, where monophenylguanidine is mentioned, will you state how you determined the substance you used to be monophenylguanidine?

A. Well, I prepared it from a standard method, and determined the melting point of the purified product.

X318. Q. What is the method, and where do you find the reference to it?

A. Monophenylguanidine—that is shown on my Norwalk work there.

X319. Q. Is it printed in here (indicating record in National case)?

A. I believe that is shown on the Norwalk sheets there. If not, there is a statement on my own card. Those are the ones (Indicating cards): "Mono. No. 7, monophenylguanidine 25 percent. By heating monophenylthiourea with lead oxide in alcoholic lead ammonia."

X320. Q. This gives you a product after crystalization, melting at 173 C.?

A. Yes, as shown on this card.

X321. Q. How did you determine that to be monophenylguanidine?

A. Well, I had nothing to determine it as monophenylguanidine except method of preparation and the melting point, and, as I remember it, I ran into difficulty on this melting point and subsequently, in connection with that paper, I believe, I redetermined

it and found out it was 193. I don't know which is correct.

X322. Q. But in order to definitely identify this product as monophenylguanidine, would you have to determine the molecular weight or make determinations of carbon, hydrogen and nitrogen, on all of those?

A. For absolute identification?

X323. Q. Yes.

A. I think you would—at least make a more elaborate identification than I did, but we did not have the necessary apparatus at Norwalk to make either a molecular weight determination, or combustion to make determination of carbon, nitrogen and hydrogen, and so forth.

X324. Q. So what you think was monophenylguanidine, and so referred to in your paper and lecture, was not in fact that—is that possible?

A. Well, yes, that would be possible, to the same extent that, inasmuch as I did not make these determinations that you speak of, and which are very, very seldom made in this kind of work, the other substances would all be subject to the same interpretation. I never heard of anyone getting a piece of rubber, in a search of the character of ours, and going into the methods of identification you mention.

X325. Q. Can you give me a literature reference prior to September, 1919, stating that the melting point of monophenylguanidine is either 173 degrees C. or 193 degrees C.?

A. No, I certainly cannot offhand.

X326. Q. What you have mentioned as mono-

phenylguanidine, diphenylguanidine, and triphenylguanidine means in fact the free base of each of these substances, does it not,—rather than a chloride or other compound of the base?

A. Yes, that is right.

X327. Q. Were your experiments, as reported in your paper, made to show the relative utility of the substances tested, or to show the increase or variation in sulphur co-efficient?

A. Well, that would be a very difficult question to answer. Any paper of this kind that would be published, you could not dwell too much on the utility of the different substances, or your superiors would feel as though you were giving away company secrets.

X328. Q. And at the time you gave the lecture and at the time you published the paper, you did not feel authorized to give away company secrets, did you?

A. We felt authorized to disseminate information which we felt would be welcomed by other chemists, and that paper which was read in Philadelphia was the first open and above board discussion of accelerators that had been presented until that time.

X329. Q. You have not answered the question, which was: Did you feel authorized, either when you read the paper, or when you authorized its publication later, to give out company information regarding accelerators listed by you?

A. We absolutely had no intention of giving any information which any other company or competitor could transpose directly for practical purposes. Our idea, however, did give enough informa-

tion so that any reputable chemist would be guided by the information in the paper.

X330. Q. Guided to the extent of being put on inquiry, to find out for himself anything you did not say—is that right?

A. Guided to the extent of stimulating investigation along the same lines with which we were pioneering.

X331. Q. And without telling him what to investigate?

A. No, sir. We gave him two tables of what to investigate.

X332. Q. But I mean, you did not tell him any specific substance to investigate?

A. Well, we gave him two tables of substances, which we pointed out were excellent accelerators.

X333. Q. And he could take his choice from any one of the substances mentioned in the two tables?

A. Absolutely.

X334. Q. And go on invesigating for himself?

A. Yes, sir, because there is no one accelerator of universal application or universal quality.

X335. Q. And he had to find out for himself, from those you listed in the two tables, which, if any, would be of most nearly universal application. Is that right?

A. Well, I didn't know that anyone was seeking for a universal accelerator. We have never found that any one accelerator would suffice for all our purposes.

X336. Q. I asked you if a chemist or rubber man had been seeking for an accelerator which would be more universal than those he had, your table did not give him any light on it?

A. It certainly gave him a great deal of light, yes, sir, because it mentioned substances that the greater number of the gentlemen who heard my lecture did not know would accelerate the vulcanization of rubber.

X337. Q. And did your lecture still not leave to your hearers the necessity of listing all the different substances mentioned by you and then going on and investigating each of them for himself?

A. Not at all, no, sir, because as has been previously brought out in this case, anilin, thiocarbanilid, and so on, were already known.

X338. Q. Then as to those not at that time already known, did not your hearers have to investigate them for themselves?

A. Most assuredly yes. In fact, even granting we had told them exactly how to use each one of those, we would assume they would investigate for themselves.

X339. Q. Does your table indicate that anilin as an accelerator is of greater activity than diphenylthiourea or triphenylguanidine based on sulphur co-efficient?

A. No. As I remember that table, anilin is less active. It requires three and one-half percent of anilin, whereas, to get the same effect with diphenylthiourea, it only required three percent.

X340. Q. In table 1 you say one part of anilin exactly equals .85 of diphenylthiourea or .50 parts triphenylguanidine. Is not that the same relation as sulphur co-efficient?

A. Yes, I understand what you mean there. The relation is approximately the same—no, I can't

concede that, because certain of these substances, as we have known all along, mislead us by the fact that they toughen the rubber, while they may have a lower sulphur content than would be indicated by the stiffness of the slab. That has been known for a long time, and it has been the primary reason we have sought to investigate accelerators.

X341. Q. Did you make any sulphur determinations on stocks cured with monophenylguanidine and diphenylguanidine?

A. I can't say as to that offhand.

X342. Q. If you had, would you have given both monophenylguanidine and diphenylguanidine the same position as to activity relatively to anilin, in your table in your 1920 paper?

A. Inasmuch as I did not make the determinations, I couldn't answer that question.

X343. Q. Have you ever made sulphur determinations with mono and diphenylguanidine?

A. I couldn't say as to that.

X344. Q. Have you made a sulphur determination of triphenylguanidine?

A. I couldn't say as to that either. I believe that there are certain of those shown in some of those papers, triphenylguanidine particularly.

X345. Q. In table 4 of your 1920 paper you gave sulphur determinations of some accelerators, and in table 1 you gave other relations, and more particularly activity relatively to anilin. If you consider those tables separately, do you not get different ratios between these various accelerators than are mentioned in both tables?

A. I would certainly think you would.

X346. Q. That is, if you take table 4 and go by sulphur co-efficient, you get one result as to activity, and if you take table 1 and go by activity relatively to anilin, you get another result, as to results of those various accelerators.

A. Is that the way the results show?

X347. Q. Is not that so? Just compare tables 1 and 4 and state if they lead to the same conclusion as to relative activities of accelerators?

A. The results of these experiments as shown by tables 1 and 4 do not, strictly speaking, compare one to the other, and it is not to be expected that they would, as I have just emphasized—certain substances, like diphenylguanidine, toughen the rubber and lead you to believe that it is more vulcanized than it is. These results in table 4 show that, judged by sulphur co-efficient, anilin is slightly more powerful than thiocarbanilid, and that triphenylguanidine is more powerful than either of the others, and all of them are within the same degree—or all of them are accelerators of approximately the same degree; that is, none of them are equal to double the quantity of the other one. I mean by that, of those three there is no one that is twice as strong as either of the other two.

X348. Q. If one were following your table 1 of your paper, would he not take anilin as 1, diphenylthiourea as .85, and triphenylguanidine as .50?

A. That is right.

X349. Q. In order to get equal effect?

A. That is right.

X350. Q. If he were taking table 4, and drawing conclusions on combined sulphur co-efficient, that for anilin would be 3.625, that for diphenylthiourea

3.078, and that for triphenylguanidine 3.872, would it not?

A. That is right.

X351. Q. So that tables 1 and 4 do not check, do they?

A. No. I have emphasized that, that you cannot make them check, for the simple reason that you are mislead by the toughness that diphenylguanidine would impart to the vulcanized slab, making you believe that it was more vulcanized than it is. If you are making any such comparisons that we are trying to make here, it will lead into a highly technical discussion as to what constitutes the right cure of a rubber mixture and that is something on which there would be a variety of opinions.

By Mr. Wooster:

I object to all the answer after "No", as irresponsive and volunteered and move to strike it out.

By Mr. Edmonds:

That is not a proper objection. The witness must have a right to explain what his view on the thing is. Counsel cannot insist on having an answer no, which is subject to distortion.

By the Court:

He may answer no first, and then put in any explanation that he may desire—is the rule of cross-examination.

By Mr. Wooster:

Well, I am asking him what the effect is as appears from the face of his paper. Now, I think your Honor must agree that this paper

is offered for what appears on its face, and what it told people at the time it came out, and that this witness may not now come in and explain it by volunteered answers — explain what he really meant to show in that paper that he published in 1920, or what he should have said that he did not say. Now, I object here to his saying something now in answer to a question that simply requires a yes or no answer, that he should have said in the paper, if it was to have the effect that defendant here wants it to have. I think you must take that paper only for what it shows.

By the Court:

You are correct as to the consideration of it, but whether your examination is along the course of his knowledge, present and future,— I don't see that the answer must be stricken.

By Mr. Wooster:

But this question is a simple question as to his paper—the two tables in his paper.

By the Court:

Well, that may require some explanation as to that, which he may deem proper. That would be for subsequent consideration.

(Question and answer read.)

By the Court:

You are attempting to show some variation now, and I think he has undoubtedly a right to put his angle on it, to explain any particular differences that may appear. I refuse your motion and note you an exception.

X352. Q. In the experiments on which this paper of April, 1920, was based, did you notice any difference in the qualities of rubber slabs cured with triphenylguanidine and diphenylguanidine?

A. Yes, I certainly must or I would not have included them in the paper the way I did. As I remember, there was a large difference in the effect of each, between diphenylguanidine and triphenylguanidine—that is, there should have been quite a decided difference.

X353. Q. In what way?

A. One should be stiffer than the other, that is, the diphenyl. should be stiffer and tougher than the triphenyl. as examined over a range of cures. Please remember that these were not made on just tests of one slab; there was a series of slabs of each, to form the estimation. Sometimes you can judge the—or make comparisons better at an overcure or undercure than you can right at the right cure or critical point.

X354. Q. Well, take the mixture you gave, which was 92½ parts of rubber, 7.5 sulphur, cure .5 part of triphenylguanidine, in comparison with the same proportion of rubber and sulphur cured with .075 part of diphenylguanidine. Did you notice any difference in those two slabs, the cure in each case being the same?

A. In that case there, under the conditions of the experiment, those two slabs should have thumbed up about equally to the thumb and tooth.

X355. Q. How about tensible, aging, toughness, and set of these two pieces, were they all the same?

A. Well, if any experiments of that character

were made they were not recorded in this paper. I would have no way of answering that question.

X356. Q. Referring to defendant's Exhibit P, card No. 5, "Preparation of diphenylnaphthylguanidine," page 487 of National record, will you explain what is indicated by "LN VII"?

A. The LN refers to the compound number, wherein LN was used, three parts on a hundred of rubber, and accelerating that mixture. LN was our code name of lagosnaphthylamine, the lagos being sulphur carbanilid, which was simply heated with this naphthylamine, the idea being to see whether or not the heated mixture was greater in its accelerating activity than the sulphur carbanilid.

X357. Q. At this September meeting of 1919, of the American Chemical Society, Rubber Section, were there other papers on accelerators and rubber subjects that yours read?

A. Yes. That was a very large and well attended meeting. There were papers on a variety of subjects and I remember one very excellent paper on accelerators.

X358. Q. Did you hear one by D. F. Cranor?

A. Yes, I did.

X359. Q. Did you hear him mention an accelerator in which one-half percent would cure in five minutes at 40 pounds?

A. Yes, I did. In fact, I had previously discussed that with Mr. Cranor in his own company.

X360. Q. So that at the time you read this paper, neither D. P. G. nor M. P. G. were the strongest accelerators known to you, were they?

A. No, sir. I discovered a stronger accelerator myself in 1910.

X361. Q. And between 1910 and 1918 you heard of others that were stronger?

A. When you speak of "stronger" you mean—

X362. Q. More active, that will cure quicker?

A. More active, and cause the vulcanization to proceed more rapidly?

X363. Q. Yes.

A. Yes, we certainly had.

X364. Q. Quite a number of them?

A. Yes, sir.

X365. Q. And some of them were known in the literature prior to 1919?

A. Of the strong accelerators?

X366. Q. Of these strong or rapid accelerators?

A. There was a patent on an exceedingly active accelerator taken out in 1912 or 1913, I believe, a German patent.

X367. Q. Well, stronger ones today apply to what are known as ultra accelerators?

A. I had had little or no experience with ultra accelerators.

X368. Q. In your practical experience with the Diamond Company, the Norwalk Company and the Falls Company, was it the common practice of any of these companies to put the accelerator into a factory compound and sell that product in regular trade, without subjecting it to practical tests?

A. It certainly was not, no, sir.

X369. Q. That is, you would not put an accelerator into your commercial product on what you found out from a thumb and tooth test, would you?

A. Before I went to Falls Rubber Company,

that was virtually the way they were testing all of their substances.

X370. Q. I mean, that was not regarded as a safe thing to do, was it?

A. Not regarded as safe, and yet there are thousands and thousands of tires being made today with no other tests being made upon them than that.

X371. Q. Now, take this tube formula that was sold to the Rubber City Clearing House, to your knowledge had that formulae ever been put in a test car and actually run, to see how that tube would stand up?

A. I believe it had, but I would not commit myself definitely there.

X372. Q. That is the T-8 formula?

A. Yes.

X373. Q. T-8 formula had been run in test cars?

A. No,—I say I would not commit myself definitely. This 63 or T-8, or whatever you call it, is a formula that has been used by other companies besides ourselves. It is essentially, in its main constitutent, that which has been used by at least two companies, to my knowledge, in the manufacture of inner tubes.

X374. Q. So that did not need any road test, is that your idea?

A. It did not need as much of a test in that way as if it had been an entirely strange or new mixture to me.

X375. Q. So you took this, what you say was a more or less standard formula, and took out the mannose R, and put something else in, with reduc-

tion of magnesia, and sold it right out on the market, without ever testing that tube in a test car, did you not?

A. Yes. Those particular tubes containing the D. P. G., I have no record of them being actually tested on a test car.

X376. Q. You did not tell the customer what you were doing, did you—at least not that part of his order?

A. No, because I knew I was giving several hundred—or two or thre hundred tubes at least of better quality than he expected. There was no necessity for telling him.

X377. Q. How can you say that, when you say that you did not distinguish the two tubes when they got through your plant?

A. Well, there was a certain number of them had D. P. G. in them, and those tubes were better tubes than the ones that did not have any D. P. G. in them.

X378. Q. But you said they could not be told apart?

A. There was no necessity of telling them apart.

X379. Q. Well, what is your basis for saying that the D. P. G. tubes were better than the T-8 tubes?

A. Well, you can tell in almost the feel of them.

X380. Q. You mean you could tell?

A. Yes.

X381. Q. But you let them go out without telling that, didn't you?

A. Certainly. There was no occasion to tell the customer about it.

X382. Q. Isn't it a fact that you simply assumed that the D. P. G. tubes were better?

A. No. I thought that they felt better and tougher. I had tests made of the stock, but I couldn't state definitely that it was made of the stock with the D. P. G. in it.

X383. Q. Referring to this exhibit U, "Physical Test Sheet"—was any of that record made by you?

A. No, sir. That was made by my assistant in the laboratory.

REDIRECT EXAMINATION.

By Mr. Edmonds:

384. Q. Doctor, you said that there was no accelerator of general application. Is that true today?

A. You mean, no one accelerator that fits all purposes equally well?

385. Q. Yes.

A. There certainly is not, to my knowledge.

386. Q. Will you name some of the conditions or factors that are considered in selecting the proper accelerator to meet a specified situation?

A. Well, my experience is mostly with tire stocks, and for our particular purposes we want an accelerator that is reasonably fast, such as D. P. G., but not as fast as the ultra accelerators. We desire to have it white, powder, non-toxic, and possibly water soluble. There would be a number of specifications on which we would all differ as to exactly what would be the ideal accelerator, but I don't know of any that meet them.

387. Q. In your work with your company, as well as in the work of other companies, the available information about accelerators is in a state of continual development, is it not?

A. It certainly is, yes.

388. Q. Then the difference between what is known now and what was known in 1921 or 1922 is very considerable?

A. Tremendous advances have been made since 1920.

389. Q. You were asked about when, after making these tubes in 1917, you or your Falls Company made use of D. P. G. in commercial operations. I wish you would state whether or not at any point in that period of time you developed any plans for the manufacture of D. P. G. by the Falls Company, and what was done in that connection?

By Mr. Wooster:

I object to that as outside the cross-examination.

Objection overruled.

Exception noted to plaintiff.

390. Q. Will you state briefly what was done in the way of plans for the use of or manufacture of D. P. G. by the Falls Company, or any accelerator?

By the Court:

Now, I don't see why you need go into detail on that, to show what he has done. It seems to me it is more or less collateral, affecting possibly his general credibility, and the weight to be given his testimony. Otherwise, I cannot see what effect it has.

By Mr. Edmonds:

I think it is without effect, unless these gentlemen think there is some special point to be made out of the lapse of time that occurred between the making of these tubes in 1917 and the publication of the paper in 1919, during which period this witness made some tests of the D. P. G., as he has already explained, and which bridges over that period of time—

By the Court:

Perhaps we are taking up longer time than it would take to bring out the testimony. Proceed.

391. Q. Will you state that?

A. The subject of accelerators at that time was difficult, in as much as you could not obtain on the open market certain desirable accelerators, not only D. P. G. but others as well. In March, 1919, I wrote our President, Mr. O'Donnell, a letter wherein I requested an appropriation to build a chemical plant for the manufacture of accelerators. I repeated this request in another letter of September, 1919, wherein I even had the plans of the building drawn up. Unfortunately the boom came to an end at that time and funds were not available to go ahead with this program.

392. Q. Can you state the exact date when you read this paper of yours at the Philadelphia meeting?

A. The meeting itself was between September 2-6, 1919, and as I remember it, my paper was read on a Thursday between those two dates.

393. Q. Now, by way of introducing the next witness, will you state whether or not you have recently,

at my request, had some rubber made up in accordance with this formulae for the 1917 tubes, with and without D. P. G.?

A. I have, yes, sir.

394. Q. And who did you have do that?

A. I requested Mr. J. F. McWhorter to make up tubes in accordance with the same procedure as used in 1917, using both D. P. G. and magnesia in the amounts I used then, and also omitting the D. P. G. and just using the magnesia, or T-8.

JOHN FRANCIS McWHORTER, a witness produced in behalf of the defendant, being duly sworn, testified as follows:

DIRECT EXAMINATION.

By Mr. Edmonds:

1. Q. You reside in Cuyahoga Falls or near there?

A. I do, yes, sir.

2. Q. And you are in the employ of the Falls Rubber Company?

A. I am.

3. Q. In what capacity?

A. As a chemist.

4. Q. Are you a graduate chemist?

A. I am.

5. Q. From what college?

A. University of Delaware, Newark, Delaware.

6. Q. How long have you been working directly in the chemistry of rubber?

A. My first work in the chemistry of rubbber was with the Firestone Fellowship, in the Fall of 1922. I

came with the Firestone Fellowship and studied at the University of Akron for one year.

7. Q. And what did you do after that?—

A. Not quite a year—at the end of the college year. Then I went with the Firestone Company in June, that following June, and worked there as an analytical chemist until February of the following year, that was February of 1924.

8. Q. And then?

A. And from there I went into sales work. I was in sales work for about a year and then I came back, and I was in rubber hose compounding with the Goodrich for about five or six months, and then I went with the Falls Rubber.

9. Q. Have you recently made up some rubber samples, at the request of Dr. Kratz?

A. I have.

10. Q. Will you produce them?

By Mr. Kennedy:

Objected to on this ground: obviously this test was one made for the purposes of the case. Nobody for plaintiff was present or invited to be present at this test. Under the authorities such tests have but little, if any, weight with the Courts. I doubt, if there is an objection they would go so far as to call for the exclusion of the testimony, but it is an effective objection so far as the weight of the testimony is concerned, and I think should be stated at the present time, before the testimony is adduced.

By the Court:

It only goes to the weight. We will overrule the objection and note you an exception.

By Mr. Kennedy:

We have no opportunity, of course, to reply to testimony like this, which we hear for the first time now.

11. Q. Will you produce these things?

A. The tubes?

12. Q. Yes.

A. (Witness produces tubes.)

By Mr. Kennedy:

May I have a running objection so as to save time, your Honor?

By the Court:

Yes. Same ruling and same exception.

A. The tube labeled A is the diphenylguanidine. The tube labeled B is without.

13. Q. These were made by you recently?

A. Yes, sir.

14. Q. At the Cuyahoga Falls Rubber Company?

A. Yes, sir.

15. Q. How does the formula for them differ, otherwise,—first, the one which has D. P. G. in it, and the other which has not—how do the formulas differ, other than that one has D. P. G. and the other has not?

A. The formulas are identical with the exception that the tube A has .2 parts D. P. G. added.

16. Q. And the other has not?

A. The other has not, B has not.

17. Q. Now, have you got here the formula that you used in making the mix for these two tubes?

A. Yes, sir.

By Mr. Edmonds:

I offer these two tubes in evidence, the tube marked A to become defendant's Exhibit V, and the tube marked B, to become defendant's Exhibit W.

18. Q. Now, what is this card that you have just handed me? What is that the formula for?

A. That is the formula for the B tube.

19. Q. And this second card?

A. That is the formula for A tube.

20. Q. And that is the formulae on which you made these two tubes?

A. Yes, sir.

By Mr. Edmonds:

I offer these two cards in evidence. They may go in as one exhibit, defendant's Exhibit X, as the difference between them is quite apparent.

By the Court:

We will admit them subject to the objection of counsel, and the same ruling and exception.

21. Q. Now, have you performed any test of the rubber going into these two tubes, that will give comparative values for certain factors in the rubber?

A. Yes, sir.

22. Q. Will you state with what result?

A. No. A, with D. P. G., records a tensile of 1858 and elongation of 688 lengthwise; crosswise, 1845 tensile, elongation 725; which gives an average tensile of 1852 and average elongation of 707. No. B, without D. P. G., gives tensile lengthwise of 1428, and elongation of 685; crosswise, tensile 1426, elonga-

tion 720, which gives an average tensile of 1427, elongation 703.

23. Q. Now, I think there is one little matter that has to be cleared up,—this proportion of D. P. G. as given on one of these cards Exhibit X appears to be .2 parts in the whole compound. Is that correct?

A. Yes.

24. Q. And the percentage of the D. P. G. to the rubber in the compound would have to be calculated with reference to the amount of rubber in these first three items?

A. Yes. That is, .2 part on 558.2 grams.

CROSS-EXAMINATION.

By Mr. Wooster:

Cross-examination without waiver of objections.

By Mr. Wooster:

X25. Q. These tests were made yesterday—October 12, 1925?

A. Yes, sir.

X26. Q. On request of whom?

A. On request of Mr. Kratz.

X27. Q. And the formula—where did you get the formulas?

A. I have the sheet here, producing photographic sheet of Exhibit E, with the exception of this part here (ind.), that is crossed out.

X28. Q. Is the quality and nature of smoked sheet rubber, to your knowledge, the same today as it was in 1917?

A. Not having used smoked sheet rubber in 1917 I am not prepared to say.

X29. Q. You don't know. The same question as to latex?

A. The same answer as to latex.

X30. Q. What is "HG Reclaim"?

A. HG Reclaim is a bundle of reclaim that I got in the shipping room of the Falls Rubber Company, with "HG" marked on it.

X31. Q. I notice on your card produced, Exhibit X, you say, "HG Reclaim", whereas on the photographic copy given you by Mr. Kratz there appears only "HG". Who told you that "HG" means the same as "HG Reclaim"?

A. Well, I have some cards to that effect, that Mr. Kratz called me over the phone and read them out over the phone, before he gave me this, with all that on it written out.

X32. Q. When did he do that?

A. That was one day last week, I can't say just what day. He called me over the phone and dictated these two compounds.

X33. Q. And you wrote them down from what he said over the phone?

A. I wrote them down over the phone, yes, and then to check absolutely, I was given that.

X34. Q. How many different kinds of "Brown Substitute", as you write it, or "Brown Sub." as written by Dr. Kratz, are there, do you know?

A. I know of only one Brown Substitute, and that is, "Brown Substitute." That is all I have ever heard of.

X35. Q. How many different brands of that material do you know of?

A. Only one, and that is, "Brown Substitute."

X36. Q. When did you first hear of that one?

A. I just heard the name, "Brown Substitute" several times.

X37. Q. Last week, is that the first you knew of it?

A. Well, I have heard of the substance, "Brown Substitute."

X38. Q. Is that the first time you have ever used it?

A. That is the first time I ever used it in a compound, yes.

X39. Q. Where did you get the "Brown Sub" which you used in making up these two Exhibit tubes?

A. The purchasing agent of the Falls Rubber plant sent out and got it.

X40. Q. Did he say that was the same that was used in 1917?

A. He gave me no information on it.

X41. Q. You don't know anything about how Brown Sub. that you buy today compares with that to be had in 1917, do you?

A. No, sir.

X42. Q. What was the brand name of this Brown sub. which you used?

A. Just Brown Substitute, that is what we order. That is what we order, Brown Substitute, and that is what is sent.

X43. Q. Who from?

A. I sent my—

X44. Q. I mean, where did you buy it? What concern did you buy it from?

A. I don't know. The purchasing agent buys it?

X45. Q. You don't know whose Brown Sub this it? Do you know the nature of Brown Sub.?

A. Do I know what it is?

X46. Q. Yes.

A. Yes, a burned oil.

X47. Q. What else in it?

A. I don't know.

X48. Q. What kind of oil?

A. I don't know.

X49. Q. Any rubber in it?

A. I don't know.

X50. Q. Any reclaimed rubber in it?

A. I don't know.

X51. Q. Any sulphur in it?

A. It has to be vulcanized.

X52. Q. I say, is there any sulphur in Brown Sub?

A. I don't know.

X53. Q. And this is the first you ever heard of it, when you were asked to get some from your stock room or purchasing agent, and make these tubes?

A. This is the first I ever used it.

X59. Q. Did you say the stock man went out and bought some, or gave you some that was already on hand?

A. We ordered it from him and he got some.

X55. Q. He didn't have any on hand?

A. He had none on hand at the time in the factory.

X56. Q. What do you understand by "mineral rubber?"

A. "Mineral rubber" is sort of a dark flaxy substance, that we put in the rubber compound.

X57. Q. Any sulphur in it?

A. I don't know.

X58. Q. What is "Blank Fix"?

A. Blank fix is a white pigment.

X59. Q. The other things mentioned here, of zinc oxide, sulphur, carbon black, parafine, magnesium oxide, are well known compounding ingredients, are they not?

A. As far as I know.

X60. Q. Where did you get the cures for these tubes?

A. From Mr. Kratz.

X61. Q. What were they?

A. Five minute rise, 35 and 40 pounds.

X62. Q. What does that mean?

A. It means you take five minutes to let your pressure go up to 40 pounds, and then you let your pressure stay at 40 pounds for 35 minutes and take your tubes out.

X63. Q. Open cure?

A. It is cured in a glass receptacle that they cure the tubes in.

X64. Q. I mean, were these tubes?

A. Cured in the regular way the factory cure.

X65. Q. How were these tubes cured?

A. In the same way that factory tubes are cured.

X66. Q. What you call open steam cure?

A. Open steam, on a mandrel. They were cured on a mandrel, and wrapped—wrapped with cloth and cured on a mandrel, in the presence of steam.

X67. Q. And then unwrapped and reversed and spliced?

A. And spliced.

X68. Q. Who did the work?

A. What do you mean—what work?

X69. Q. Of compounding.

A. Of putting up the material—the chief mill man and myself.

X70. Q. Who broke down the rubber?

A. The chief mill man and myself.

X71. Q. Who did the milling?

A. The chief mill man and myself.

X72. Q. Who did the weighing?

A. The chief mill man and myself.

X73. Q. Who did the calendering?

A. The chief mill man and myself, with three or four others around.

X74. Q. It took two of you to weigh out the accelerator?

A. I weighed the accelerator myself.

X75. Q. Where did you get that accelerator?

A. It was a sample of D. P. G. from the American Cyanimid Company—a tin box.

X76. Q. Oh, not made by Mr. Kratz?

A. No, sir.

X77. Q. What is known as commercially pure D. P. G.?

A. I know nothing further than the fact that we used it in the laboratory.

X78. Q. That is a standard brand of D. P. G. on the market today?

A. Nobody markets it but the American Cyanimid Company.

X79. Q. That is a standard brand on the market today?

A. So far as I know.

X80. Q. This is the first time you ever used it?

A. The first time I ever used it in tubes.

X81. Q. The first time you ever compounded D. P. G.?

A. Only in experimental work.

X82. Q. How many brands are there on the market today?

A. I can't distinguish between that.

X83. Q. You know only one, this American Cyanimid brand?

A. That happened to be the one I used.

X84. Q. Who told you to get it from the American Cyanimid Company?

A. We had it in the laboratory.

X85. Q. What is this mannose R which is mentioned on this photograph which you produced?

By Mr. Edmonds:

Just a minute. I think you ought to respect Dr. Kratz's disinclination to make that public. He has told you that is an accelerator and he has told you a perfectly legitimate reason why he does not want to have it stated what that is, and I think that ought to be respected.

By Mr. Wooster:

We have here a witness who knows what it was, and is going to say so, and there is no more reason now for Dr. Kratz and Mr. Edmonds not telling what Mannose R was, or is, than there was in the National suit, where the in-

quiry was made, and it was not pressed, and we determined to press it here as far as the Court will receive the evidence. We think it is just as likely that the tubes that were sold to the Rubber City Clearing House in 1918 were made with this Mannose R as they were with thio. or D. P. G., or magnesia, or anything else. We think it quite important in this case that that be stated. And moreover, the Falls Rubber Company has not been subpoenaed here. Its Vice President comes here voluntarily, and he brings the company's records with him, presumably with permission of his company, if he needed any, and we don't think he should come here and make a secret of something that is not really a secret.

By Mr. Edmonds:

Aside from my previous objection, this question is irrelevant as put to this witness. This witness has not used any mannose R. The substance that he used are on these two cards, Exhibit "X," and what is on these cards is all that he has been questioned about.

By Mr. Wooster:

Oh, no.

By Mr. Edmonds:

Counsel goes outside the direct examination.

By the Court:

There is not much question about it, if that is the only one.

By Mr. Edmonds:

No, sir, there is no mannose R in there, in those two tubes, which is the only thing this witness has been questioned about.

By the Court:

Well, that would make it very plain. If he did not deal with it, then it would be entirely outside the cross-examination. I will sustain the objection, put in that form, because I do not think it throws any light on the present inquiry before us, and it would be just a mere disclosure of a secret which may be of value or no value, I don't know.

Adjourned until Wednesday, October 14, 1925, at ten o'clock A. M.

Wednesday, October 14, 1925.

MORNING SESSION.

JOHN FRANCIS McWHORTER resumes the stand.

By Mr. Wooster:

The tube offered as Exhibit "W," made according to formula 63-W, the card forming part of Exhibit "X," is further objected to as immaterial and irrelevant to the issue in this case, because not made in accordance with the testimony that Mr. Kratz gave yesterday, wherein he said that three parts of magnesia were used in the tubes which did not have D. P. G., and this exhibit card of compound 63-W shows one

part. This exhibit, therefore, is no standard of comparison with what Mr. Kratz says he made.

CROSS-EXAMINATION (Continued)

By Mr. Wooster:

X86. Q. How many plies are these exhibit tubes?

By the Court:

As the statement was, I don't think that affects the admissibility of the matter in evidence to show what he has done.

By Mr. Edmonds:

I do not offer these tubes on the theory that both of them are products of what Kratz did. We offer them on the theory that the difference between them will be enlightening as to the effect that certain substances have.

By the Court:

An exception is noted to the plaintiff.

By Mr. Wooster:

X87. Q. How many plies are these tubes made from?

A. Two plies.

X88. Q. Where did you get that instruction?

A. It is the regular way of making up factory tubes.

X89. Q. Mr. Kratz didn't tell you to do it that way?

A. He just told me to make them up in the regular factory manner.

X90. Q. You used two plies on your own responsibility?

A. I used two plies because he told me to make them in the regular factory manner.

X91. Q. Do you not at times make three and four ply tubes?

A. Not to my knowledge.

X92. Q. Have you the weight of these tubes?

A. I have not.

By Mr. Edmonds:

Mr. Wooster says he wants on the record the weight of these two tubes without the valve stems. Will you please take the tubes with you to some place in this building, where I understand there are scales, and weigh them, and come back here and report what the weights are. That I understand concludes this testimony.

SETH R. CLARK, a witness called on behalf of defendants and duly sworn.

By Mr. Edmonds:

As I stated a day or two ago, we entered into a stipulation that the testimony of certain witnesses in the National suit might be received here as though taken here. Among others, was the testimony of this Mr. Clark. At the time I asked Mr. Wooster to include Mr. Clark in that stipulation, as I had no idea of bringing him here to the trial; but since then we have found it was possible to do so. So if Mr. Wooster cares to withdraw from the stipulation, so far as concerns the testimony of Mr. Clark, I think he should be permitted to do so, and we will take Mr. Clark's tes-

timony all over again. On the other hand, if he will allow the testimony to stand as it is, we will simply go on with additional matter.

By Mr. Wooster:

I would prefer that the stipulation stand, and that the deposition of Mr. Clark as given in the other case be taken for what it is worth, as far as it goes, and let Mr. Edmonds proceed.

By Mr. Edmonds:

That is what I prefer.

By the Court:

Very well.

By Mr. Edmonds:

1. Q. You were in the employ of the Republic Company around in 1915, '16, '17 and '18?

A. I was.

2. Q. And you knew Mr. Brill, who was employed by the Republic?

A. I did.

3. Q. What was your capacity with the Republic Company?

A. During those years, I was assistant mill superintendent in charge of development work.

4. Q. And Brill's position was what?

A. Brill's position when he first came there was chemist in the laboratory, and he was later appointed chief chemist.

5. Q. What accelerators were you using in 1916 and the early part of 1917?

A. We were using thiocarbanilid back in some years. I am not sure just when we started. We also

used in a small way paranitrosodimethylanalin and hexa.

6. Q. Were those accelerators that you were using considered by you and other officials of the company to be satisfactory?

A. Not wholly. Please understand that our production there, in those years especially, was probably more along the line of mechanical goods than it was in tires, and we were especially working for an accelerator which would work especially well with our mechanical goods. None of these filled the bill.

7. Q. If they were not entirely satisfactory, what did you do to try to improve conditions?

A. We were continually on the search for accelerators. Moreover, if we heard of a chemist whom we thought had some experience in accelerators, we would try to pick him up. In our search for accelerators, on account of all information on accelerators being held more or less secret at the time, it was a question of trying things out hit-or-miss, and seeing whether they would work or not. Of course, we had certain ideas as to what classes of organic materials would fit in with what we wanted to try to find.

8. Q. Are you a chemist?

A. I am a chemist.

9. Q. Did you confer with Brill in connection with this matter of finding a better accelerator?

A. I did confer with Brill and others in the organization.

10. Q. Once or many times?

A. Many times.

11. Q. What was the result of your consultations with Brill, what conclusion did you reach?

A. The time of the different chemists there in the laboratory was pretty well taken up with outside matters, following troubles throughout the plant. We finally came to the conclusion that the only way we could make what progress we wanted to on accelerators was to put a special man on that work. That I know was during Brill's time.

12. Q. What was the nature of the progress that you wanted to make on this work?

A. We wanted to put a man on it who would devote all his time to investigating right down, wherever we could find them, organic materials.

13. Q. Then you proposed to have some trained chemist investigate a series of substances?

A. Absolutely.

14. Q. What series of substances?

A. Well, the first thing they would have to be organic materials that would melt within the range of our rubber. We had decided by that time they must be organic materials that we would reach in nitrogen and basic.

15. Q. Did you get a chemist to do that?

A. We did.

16. Q. Who was that?

A. Mr. Baldwin.

17. Q. Did you put him to work on this job you said you wanted to work on?

A. We did.

18. Q. What did he do in that job?

A. He was supposed to do largely as I outlined, and he did it. I would like to say that I never posed as an organic chemist. I therefore put it up to Brill to get together with Baldwin and go right down

through whatever literature he had, and search out and try out anything that looked good, and not only myself but Mr. Peterson would O. K. the purchase of anything we could get that looked anything favorable at all.

19. Q. Do you know whether a selection of substances for this trial in this manner was made?

A. I do.

20. Q. What was done about obtaining these substances?

A. We just simply made out a list of accelerators and gave it to our purchasing agent to purchase. I probably wouldn't recall very much about that, except that on account of the fact that this was along during the period of the war, numbers of these accelerators were very very hard to obtain, and I know that on several occasions the purchasing agent, when he would be with me, would tell me—would sort of throw up his hands and say, "Well, I can't get some of those materials, and some are going to cost you an awful lot of money." I would be safe in saying that I know some of those were quoted to us at prices of four or five dollars an ounce.

21. Q. Are you able to state now, from your recollection, the names of definite substances that were tried in the course of that work?

A. I cannot.

22. Q. You have no recollection of the specific test made with D. P. G.?

A. No, sir.

23. Q. This X-book of course you recognize as one of the laboratory books of the Republic Rubber Company?

A. I do.

24. Q. The use of this book as a place to record experiments was well known to you?

A. Yes. I installed that system.

25. Q. The book referred to is the 2000 X-book. Did you give any instructions as to what was to be recorded in this book?

A. It was an infallible rule that every experiment was to be recorded in the X-book at the time it was mixed.

26. Q. I call your attention to the entry on page X-2005, in the first column of figures, where it indicates that the test was one of a compound including one part of diphenylguanidine. What have you to say about that?

A. I dont recall any such test having been made, but I am not at all surprised that it is there.

27. Q. Would such a test be in line with the work you said Baldwin was hired to do, and did do?

A. It absolutely would be.

28. Q. Now, turning to a later time, do you recall that Weiss was employed there in the laboratory, and you were familiar with his employment?

A. Yes, sir.

29. Q. Were you familiar with the character of his work?

A. I was familiar with it.

30. Q. Was that work satisfactory?

A. It was not wholly satisfactory.

31. Q. Did the unsatisfactory character of work come to your attention?

A. It came to my attention in such a way that

several men in the organization, not wholly in the laboratory, men outside of the laboratory in the organization, commented to me regarding Mr. Weiss's continued employment in the laboratory.

32. Q. What did you decide to do about it?

A. We decided that as time went on, we would try to select men whom we thought more fitted for the position.

33. Q. Did you discuss that with Daniels?

A. I remember very distinctly discussing it with Daniels at various times.

34. Q. Did Daniels indicate any difference of opinion as to Weiss's ability and value to the company? Did he indicate that he held a different opinion from the one you have just expressed?

A. Not any very fixed opinion; no, sir.

35. Q. Did he ever state to you that Weiss had developed something that would have been of value and would justify keeping him?

A. Never.

36. Q. Did he ever state that at any time through the year 1919?

A. No, sir. During the latter part of 1919, Mr. Weiss's progress on making D. P. G. was so small that it was quite the reverse.

37. Q. At any time up to September, 1919, did Daniels ever say to you that Weiss was developing something that would probably be of considerable value to the Republic Rubber Company, and that you had better keep him for that reason?

A. Not to create any impression on my mind.

38. Q. Nothing of that sort occurred?

A. No, sir.

39. Q. What about Stevens, another employee there? You sent him to New York along in the fall of 1919. What was the purpose involved in that?

A. Mr. Stevens went to New York to investigate, in the first place, mechanical belts. I believe on his first trip he investigated little else, but on his second trip we combined the investigation of belts with the investigation of accelerators in general, largely at first to better our method of making T. P. G., which during 1919 I would say we considered our main accelerator, aside from thiocarbanilid. We had almost passed up paranitroso and used very little hexa., because hexa. caused poisoning in the plant. So the last trip that Stevens took was both on belts and accelerators.

CROSS-EXAMINATION.

By Mr. Wooster:

X40 Q. When did this discussion, to your recollection, first come up, regarding the unsatisfactory work of Mr. Weiss?

A. I couldn't give you any exact date.

X41. Q. What year?

A. I can fix one date. One date was during the regime of Mr. Norwood, which was during 1918 and '19. I know certain men in Mr. Norwood's organization spoke to me regarding the unsatisfactoriness of Mr. Weiss in the laboratory.

X42. Q. Would you say it was in 1918 that this objection to Mr. Weiss was first voiced?

A. I doubt very much if I heard very much about it until in 1919.

X43. Q. What part of 1919?

A. Probably fairly early in 1919.

X44. Q. February of 1919?

A. I wouldn't put any exact date on it.

A. I don't know.

X45. Q. When did Mr. Weiss leave?

A. Mr. Weiss left the employment of the company in March, 1920.

X46. Q. Was it within your authority to discharge him?

A. It was.

X47. Q. You didn't do it?

A. No, sir.

RE-DIRECT EXAMINATION.

By Mr. Edmonds:

48. Q. You didn't discharge Weiss?

A. I discharged him in March, 1920.

49. Q. It was not within your province to do it before that?

A. It was.

50. Q. In March, 1920, you had specific directions to do it?

A. I had specific directions to let him go.

51. Q. And would you say the same of Mr. Daniels?

A. Yes.

By Mr. Wooster:

52. Q. Wasn't Mr. Weiss's salary raised during the year 1919?

A. I wouldn't say as to that. It may or may not have been.

JOHN VREELAND HARING, a witness called on behalf of defendants, having been duly sworn, testified as follows:

DIRECT EXAMINATION

By Mr. Edmonds:

1. Q. Where is your residence?

A. 114 Park Avenue, Newark, New Jersey.

2. Q. And your occupation?

A. Examiner of questioned documents.

3. Q. How long have you followed that occupation?

A. For over thirty-five years I have been engaged in penmanship work, designing alphabets for educational purposes to be used for copy-books, plain and ornamental penmanships, making facsimile signatures, and for over twenty years I have been called upon to pass an opinion regarding questioned handwriting.

4. Q. Have you frequently had occasion to testify on such matters?

A. I have testified in New York, New Jersey, Pennsylvania, Maine, West Virginia, and other states.

5. Q. I call your attention to the 2,000 X-book, page X-2034, and particularly to the date at the bottom of the column "E". It has been stated in this record that the figure indicating the month of the date at the bottom of that column has been changed, and that after being changed it was supposed to represent a "2". Will you state what figure, in your opinion, was there before the change was made?

A. I will.

6. Q. Please do.

A. Figure 9.

7. Q. Will you state your reasons for asserting that the figure there initially was the figure "9"?

A. The manner in which the oval is attached to the staff. Also, in comparing it with the figure "9" in the same entry, and the way in which it was built up into a figure "2".

8. Q. Will you explain more fully what you mean by the way in which the initial figure was built up into a "2"?

A. By the addition of a little stroke in a horizontal manner at the base of the oval, and the addition also of a little tick or stroke in the right side of the oval half way up; by the addition of the horizontal base line at the base of the staff.

9. Q. Can you give any reasons why the original figure was not a "1"?

A. Yes. The manner in which the loop is formed, or the oval, would be inconsistent with the making of a "2" out of the figure "1". The person who changed it would first have to make a "9" and then change it into a "2" by adding the horizontal line at the base of the staff. The entrance also of the base of the oval that was untouched by the second operation, into the staff or down-stroke of the main part of that figure, shows that it was a part of the figure "9".

10. Q. Can you elucidate further your statement that the figure there initially was a "9", by reference to any photograph studies of this date?

A. I can. I ought to state also that I have examined this previous to this occasion. I have also examined it with the aid of a microscope under daylight, and with magnifying glasses of varying strength.

11. Q. Will you proceed with your reference to photographs?

A. I had the page photographed at the office of the Lee Tire & Rubber Company of New York City some three weeks ago. I then had prints of that negative made, and I also made prints myself from the negative. I enlarged those prints to this present enlargement.

12. Q. State what that shows?

A. That shows the figure "2" segregated from the balance of the entry, in enlarged form, about seven times as large, showing in prominent form what is observable by the microscope.

13. Q. What did you discover on the study of this enlargement?

A. That in converting the figure "9" into a "2", the pen had been lifted in an unusual way. In some instances, for instance, in making the staff of the figure, the penholder was held directly pointing toward the body of the writer, turned in this manner toward my person. In making the additional stroke at the base of the oval, the pen was held in a different direction. It was held off to the right of the writer, away to the writer's shoulder, making the nibs spread in that horiontal direction. The base of the staff in attaching the bottom stroke of the figure 2 as it stands was also made with the pen held well over to the right of the writer. The formation of the oval, as originally made, is shown by an unattached portion which shows the collar on this photograph, to enter into the staff in the same manner as the accompanying entry 9 enters the staff at that point of the

oval. The little tick was aided in the center of the oval, to the right side, entering the staff, with the pen held in the position similar to that when the bottom of the staff was made at the time of the "2". This tick would indicate that the pen started at that point in forming the oval, but the indication of the line contradicts it. The indication of the balance of the oval contradicts that it started at that point. The pen was held off to the right in that manner in making this start, making an increased pressure and deposit of ink as it entered into a down-stroke. Now, if the pen were continued, started there and came down, made a turn at the bottom, and then up at the top, there would be an increased pressure at the top right corner equal to the tick, or even greater than the tick where it entered into the main down-stroke of the figure.

14. Q. But no such increased pressure is there?

A. No. On the other hand, the line indicates that it was made with an upward stroke and then entered into the oval with a little deposit of ink, not a spreading of the nibs.

15. Q. The line you refer to is the loop of the "9"?

A. The top lefthand loop of the "9", similar to the shade appearing on the "9" in the same entry. Then it comes down along the left side of that oval, and at the base of the oval appear to pen nibs, impressions, where the line was drawn and entered the staff. Now, immediately above those pen nib impressions is a little color showing where the original pen stroke, unshaded, unrecorded with nibs, similar to the "9" accompanying, entered into the staff.

16. Q. At that point the original "9" was retouched?

A. Yes; and the staff made with a spreading of the bottom portion of it into the staff.

17. Q. The "19" of the same date?

A. The same entry.

18. Q. Have you not tried to dissociate the two figures that made up the changed figure?

A. I have. I have painted out with Chinese white a portion of the tick in the center of the oval, the base of the "2", and leaving a skeleton effect of the original figure "9".

19. Q. Have you done the same thing with the "9", so as to leave the "2", or was that unnecessary?

A. The "2" shows in the white.

By Mr. Edmonds:

I offer in evidence these three photographs as Defendant's Exhibits "AA," "BB" and "CC."

20. Q. Before you announced your conclusion that the figure initially there was a "9", did anyone, —myself or anyone else,—suggest to you in ony way whatsoever what figure might have been there, or what figure we thought was there?

A. No, they did not.

21. Q. Look at page 2066. Is there anything distinctive about the ink that is used on that page?

A. Yes.

22. Q. What is it?

A. It is a bluer color.

23. Q. Is that same ink used on pages 265 and 264, columns "E", "G" and "H"?

A. It is.

24. Q. And page 259, columns "D", "E", "F" and "G"?

A. Yes.

25. Q. Is that same ink used in any records that you find in the X-book dated in 1919 and prior to September 10 of that year?

A. No; not before October 3.

26. Q. Now, will you look at page "X"-2005, and I call your attention more particularly to "Action of Organic Accel." at the top in print lettering, and "Diphenylguanidine" in the column of substances at the left. Are you able to state whether or not "diphenylguanidine" is or is not in the same characteristic printing as "Action of Organic Accel."

A. I am.

27. Q. What is the fact?

A. They are by the same hand.

28. Q. Look, please, at the body of the printing at the bottom of the page opposite, X-2001, and state whether or not that is in the same characteristic printing as "diphenylguanidine" on page X-2005?

A. I also made a study of that previously, and in my opinion it is in the same hand.

29. Q. Will you state your reasons for asserting that these three things were put in the book in the same peculiar characteristic way?

A. The form of the "u," the form of the "n" and the "a," and the general effect of the combination of letters and other identifying points.

29½. Q. What is the distinctive thing about the "u"?

A. There is a little twist at the bottom of it, making a wormy effect. That appears in both entries.

30. Q. You refer to the "3"?

A. It appears in the entry on the side of the column 2005 and also appears in the page 2001.

31. Q. Give another instance. You said there was something peculiar about the "n"?

A. The "n" is made in a contradictory way in the "guanidine," there being two "n's" present. One is made with a cross stroke from the top left down to the right bottom, and in the other instance, from the left bottom up to the right top. I find the very thing to exist and be present in the lettering on page 2001.

32. Q. Now, have you made any photoghaphic studies of these that verify the statements you have made?

A. Yes.

33. Q. Will you state what those are?

A. I had a negative of this page. I printed it, and from the print I cut out sections. That letter is corresponding to the letters of the word "guanidine," and I placed them in similarly alphabetical order, showing those words, which I have here. I then rephotographed them and enlarged them, and you have the enlargement in your hand.

34. Q. Now, take this part at the top of the sheet you have just produced. In the middle is "diphenyl," and under it "guanidine." How did you produce that "diphenylguanidine" in the middle of the upper section?

A. At the top line is the word "diphenyl," as cut out and arranged by me and rephotographed.

35. Q. Cut out from what?

A. From the photograph made at the bottom of page 2001, placed above the word "diphenyl," which

was photographed and enlarged from page 2005. Beneath that word "diphenyl" appears the word "guanidine." The letters in that word were photographed from the lettering at the foot of page 2001, and placed beneath the word "guanidine," it being the bottom line of the "4", showing the cut-out arrangement of the word "guanidine"?

36. Q. I am afraid there is some confusion about this. The second and third lines come from where, of this upper section. From what page of the X-book?

A. The second line came from page 2005.

37. Q. And the third?

A. The third came from the associated letters from 2001.

38. Q. And the fourth?

A. The fourth line came from the arrangement made by me from the photograph of page 2001.

39. Q. You still have not cleared the confusion. As I understand you now, 3 and 4 both came from 2001. Is that the fact?

A. That is not the fact.

40. Q. State what is the fact? Where did the third line come from?

A. The third line is from the column.

41. Q. What column?

A. The column on page 2005.

42. Q. Now, will you show how you built up the first and fourth lines which I understand you got from page 2001.

A. I have them here arranged on the card, where I cut out the letters and pasted them together from the photograph—cut them out from the photograph

and pasted them together on this card, arranging the words as appears on the cards.

43. Q. Have you got the prints from which you cut out the letters?

A. I have.

44. Q. Now, you have presented to me two photographic prints of the matter at the bottom of the page opposite 2001 of the X-book enlarged, and from which it is evident numerous letters have been cut out. Are the letters so cut out the letters which you have pasted on this small white card?

A. They are, with these three exceptions, which are pasted on another card.

45. Q. And this card, with a photographic reproduction of "diphenylguanidine" from page 2005, in the middle, and "diphenylguanidine" above and below it, made up from letters cut out of this larger print, is what you photographed to produce the paper that you first produced?

A. That is right.

By Mr. Edmonds:

I offer in evidence the photographic print first produced by the witness as Exhibit "DD", and the two cards identified by the witness, with "diphenylguanidine" built up on one of them, and three unused letters on the other, are offered in evidence as Defendant's Exhibit "DD-1."

The two prints of the matter at the bottom of page 2001, from which the witness cut out the letters he used in making Exhibit "DD", are offered in evidence as Exhibit "EE".

46. Q. Are you able to state whether or not the same ink was used in making the entry of "diphenylguanidine" in the left hand column of X-2005, in making the entry "Action of Organic Accel." at the top of 2005, and in making the entries that appear on the two sheets X-2001?

A. At the foot of X-2001 would be the lettering. I made a microscopic examination, and in my opinion, it is the same ink. The three are the same ink.

47. Q. Have you made an examination of page 2005, in the effort to detect any evidence of alteration on that page?

A. I have.

48. Q. Did you find anything that suggested an alteration?

A. Nothing whatever.

CROSS-EXAMINATION.

By Mr. Wooster:

X49. Q. Referring to the entry at the foot of column 2034-E, did you explain in your direct examination how, in your opinion, the dark spot inside of the oval got there?

A. It was placed there independently.

X50. Q. Wouldn't that be possible to happen in the case of a person writing the numeral "1"?

A. It might, but I don't believe with this writer.

X51. Q. Do not many people make a slight hook or knob at the top in making the numeral "1"?

A. They do.

X52. Q. And sometimes bear down heavy at the top?

A. Yes.

X53. Q. And sometimes start to make a "1" by a slight upward movement and then down?

A. Yes; and sometimes almost make it look like a "7"; but this writer didn't.

X54. Q. If the writer made the numeral "9" first, why would he make that spot inside of the oval?

A. That we have just been discussing?

X55. Q. Yes. If he wrote "9" first, why would he make that spot in the oval?

A. You mean the original "9"?

X56. Q. Yes.

A. It wasn't there on the original "9", in my opinion. That has been added there to give an appearance of an initial stroke for the figure "2", formed it into a spiral, but it is contradicted by other portions of that oval.

X57. Q. But isn't it also contradicted by the "2" in the column "E", X-2034, opposite "M. G. O."?

A. No. That has been in perfect harmony from beginning to end, the sequence of line and impressions of the ink, is in perfect harmony with what appears there.

X58. Q. But if a man wrote out the numeral "9" there and wanted to turn it into a "2", would he not naturally put the horizontal bar at the base of the "9"?

A. Yes. It is so done in this small sized "2" there, at the lower and end portion of that figure; but when you enlarge it or look at it with a microscope, you can see it is away from the base of that staff.

X59. Q. But why would he then, after putting

that base line on, go up into the oval and put that big gob of ink inside of it?

A. He may have done that first. I don't know that he put that through last. Just how that was recorded, I don't know. But the reason for that is, in my opinion, to give it a little start and take it away, rob it of the "9" appearance and give it the "2" appearance.

X60. Q. But how does filling up the oval help make a "9" resemble a "2"?

A. It gives an excuse for the entering into the line of this lower part of the oval, and then coming out again at that point.

X61. Q. Now, if you start with the "9" originally written, would you say that spot in the oval was not there?

A. No, it was not there.

X62. Q. In which way was your oval made when the "9" was originally written?

A. It was made the same as we see this "9" on the same entry.

By Mr. Edmonds:

X63. Q. According to the "9" in the "19" of the date of the column "E"?

A. With the upward directed stroke, then the loop formed to the left of the staff, and then the lefthand side of the loop going down and turning at the base and coming up and forming a blind loop at the staff.

By Mr. Wooster:

X64. Q. That is, you think it was a clean oval made by the pen going counterclockwise, and then

up to the starting point, and then down, to make the stem or staff?

A. Yes; forming a blind loop at the top of the staff.

X65. Q. You think it was a closed loop originally?

A. Yes, like what appears on this figure "9" of "19"?

X66. Q. Is it possible that the vertical line, including the spot in the oval, and then down to the base of the numeral, was made at one stroke?

A. It is possible that it was made without lifting the pen from the paper, but the angle of the penholder was turned when that was made, and holding the pen at one angle when the tick was made, then turning it and bringing it down toward the writer, and the pressure that would be placed upon it would spread those nibs, as recorded in the photograph.

X67. Q. Would it not spread those nibs just by ordinary pressure, without turning the penholder?

A. No. If the penholder were pressed with a pen held in the same direction that the tick was when the tick was made, then the pen would dig into the paper. The pen nibs would follow each other, and would not travel side by side.

X68. Q. Was the horizontal base line, in your opinion, made with a separate stroke?

A. Yes.

X69. Q. I still do not see that you have given a clear explanation of why a man desiring to change a "9" into a "2", which "9" you say was originally made with a clear unobstructed oval, would after

making the base line at the bottom of the staff go up to the oval and put something inside of it?

A. I don't say that he did make the base staff and then go up to the oval. He may have put that tick there at that point that you refer to inside the oval, before he made the base line, but the purpose of making the tick inside the oval is to make the top portion of the figure "2" spin around, have the appearance of spinning around.

X70. Q. If he were trying to do that, why would he not have made that tick outside to the left of the oval?

A. Because that would not define that spiral. The oval being already there, some use had to be made of it, giving it a finish. If that tick were not inserted, it would look like this one which I have painted, with the painted out tick, which shows a remarkable suggestion of figure "9".

X71. Q. Well, now, could you not by the same process of elimination, paint out the oval and the base line and obtain figure "1"?

A. Yes, you could paint that oval out. I left what was remaining of the oval, that part of the oval which had been untouched by the second operation. That section of the oval shows no nib imprint whatever. That is a portion which I left, showing that it was a portion that belonged to the original figure.

X72. Q. Did you bring the negatives of these photographs with you?

A. I did.

X73. Q. These retouched ones?

A. This retouched one—all the retouching has been done on the paper.

X74. Q. How about the negatives? Have they all been retouched?

A. They are just as pure as when they came from the Eastman Kodak Company.

X75. Q. Referring to the photograph "CC", how did you get the aligning of the individual letters which you cut out to form "diphenyl"? I mean, how did you line up the base of these letters?

A. I ligned it up first in a horizontal line, where this end in the original—

X76. Q. No. This you made up of individual letters, the top one?

A. Where the end in the photograph descended below the base line, there I let the end descend in the arrangement I made, keeping correspondingly as closely as I could to the horizontal base line of the original.

X77. Q. Do I understand you to say that you made up this word "diphenyl" in the top line of this exhibit, by cutting out a lot of individual letters from X-2001?

A. That is right.

X78. Q. Now, with those individual letters cut out, you had no line or base line on which to place them, had you?

A. No.

X79. Q. That is your own idea of the way they should be?

A. My own arrangement as to the base line; for instance, the "yl" on the original entry in the column "diphenyl", the top is on a horizontal line.

X80. Q. You took individual letters from 2001. Where did you get the "yl" from the 2001? You said you got "yl" from 2001. Where did you get it?

A. I can show you on the sheet here.

X81. Q. Where did you get "yl" at the top line of this photograph "CC"? This "yl" doesn't correspond with either of those. Does your "yl" in the first line of this exhibit "CC", which you say you made up from cut-outs on page X2001, correspond with the "yl" on X-2001, opposite X-2001-X, in "phenylhyrozine," "M. G.," or in X-2001, "hexamethylenetetramine"—not quite as good as X-2000-C?

A. Very, very close to the one in the X-2000-C hexa., very close, the "y" and the "l", the "y" extending down below the base line of the "l" with a little curlycue for the base line of the "l"—very close. In the other one the same—that is X-2001-C—the arrangement there is not as close as the other arrangement which we spoke of.

X82. Q. How did you get the slope of the letters in this at the top, "phenyl"?

A. I followed the cut of the base line and on the photograph it shows the clipping, and that shows the base line being a horizontal line.

X83. Q. How did you get that base line?

A. I cut them out as you see the clipping, approximately a horizontal line with the line of writing.

X84. Q. You got those horizontals by hand?

A. Yes.

X85. Q. Not with a "T"-square?

A. No, it is just a freehand arrangement of those letters on this card, and then rephotographed

to this size, the exact duplication of this word "phenyl" appearing in the column, I would never hope to find, but I do find other letters in the body lettering of this man, made in principle the same as the principle in the column lettering. Because I can't at this moment find that "y" is not conclusive that it is not here, because I assure you the cut-out is here.

X86. Q. Now, referring to X-2001, righthand page, would you say that the writer of all that printed at the bottom there had a pretty good idea of writing on a straight line without any ruling, when he printed?

A. The line is very, very clear across the page, with a very good line.

X87. Q. A very good line, wasn't it?

A. A very good line. There are incidental parts of words where the letter would jump above and away from the base line, and sometimes over the base line. The idea is that he keeps his capitals a little above, but he has a system there—a little at the initial line of the word.

X88. Q. A little above?

A. Yes, a little above.

X89. Q. The main line of the word?

A. Yes, the main top line.

X90. Q. In the "diphenylguanidine", and particularly the "guanidine" on X-2005, is not the "g" decidedly dropped below the rest of the letters?

A. Yes, and it rises above. I have just been testifying as to the top portion, how it rises above the following letters. This "g" which you have asked me about rises above and also goes below.

X91. Q. But doesn't the "g" go decidedly below?

A. It does.

X92. Q. If a man came to write this word "guanidine" on X-2005, and found that big letter "D" for "D" shoddy below it, would he not naturally put that "G" down, and then find that he had to go up with the "u" to clear the "D" and the tall loop of the "h" in "shoddy"?

A. I should think he was very shortsighted to do a thing like that, but the "i" in "guanidine" shows that he was not afraid of this, or any letter, being there at all. He simply made it on the base line.

X93. Q. But he cleared the loop of the "h", didn't he?

A. He doesn't touch the "h".

X9. Q. Then he cleared it, didn't he?

A. No, I don't believe the "h" was there when it was put in, so the "h" cleared the "i".

X95. Q. Why did he drop the "g" below the rest of the line and print his "guanidine" horizontally?

A. I suppose for the same reason that the "f" in the word "formaldehyde," the last word on page 2001, was dropped below the line. Nobody knows except the man himself;—the same as the "y" in "yellow" appears on page 2001; the same as "a" in "ammonia" drops below the line; the same as "a" in "accelerator" drops below the line. He had a habit of doing that.

X96. Q. But he has the word "guanidine" on a decidedly upward slant on this "D" Shoddy, hasn't he? That is more or less parallel to a tangent be-

tween the top of the "d" and the top of the loop of the "h". Put your straight-edge on those things and let us see.

A. The "u" descends into the blue line ruled there. The "a" comes away below the blue line. The "n" comes away below the blue line. The "b" rises above the bottom portion of the blue printed line. The "e" comes down to the bottom of the blue line. There is a straight-edge blue line there.

X97. Q. "Guanidine" isn't parallel to it there?

A. You are not fair at all. Unless you use the same principle over on page 2001, dropping your ruler to the base of the initial stroke.

X98. Q. But isn't the word "guanidine" in this X2005 on a decided curve, not on a straight line?

A. Not any more of a curve than is accustomed to be made by the writer in this 2001?

X99. Q. Will you swear that there is not a pronounced curve generally following the outline at the top of the "D" in those letters "g", "u", "a", "n"?

A. The "n" is a little higher at the top than the "u", and also square with the "i", and is as low as the "u"; the "d" comes up at the right, and the following "i" comes down below the "d" at the top line, and the final "e" is lower than the last stroke of the "n".

By Mr. Wooster:

I asked him about "g", "u", "a" and "n".

By Mr. Wooster:

X100. Q. In making up your Exhibit "CC" from this X-2005, you have left out the top of the

"D" and the loop of the "h", have you not? In "'D' shoddy," it is immediately "guanidine."

A. I have not arranged that, no.

X101. Q. Why did you not bring those in?

A. I was interested in showing the identity of the writer of this lettering, and had nothing to do with the "'D' shoddy." That didn't enter into the proposition.

X102. Q. You had no interest in shedding any light on the question whether "'D' shoddy" was written there before those words "diphe[illegible]yl guanidine" were printed in?

A. Yes, I have studied that angle of the question, but that was not the purpose I had in photographing it. Had I been asked to show that portion of it—I was not asked to, but I did enter into that subject, and I find this: that there is considerable space left before the word and above the word "'D' shoddy," and unusually greater space than what appears to be left below there by the same writer. Now, to my analysis of the situation, it would mean that the "phenyl guanidine" was there before the "'D' shoddy" was written.

X103. Q. Then, as I understand it, there is no significance in the dropping of the "g" and the curvature downwards of the "uan" in 'guanidine" relatively to the dropping of the "D" and dropping of the loop of the "h" in "'D' shoddy"?

A. The only significance that has would be, that I find the same characteristics in the writer of 2001, and in that way it is a point of identity.

X104. Q. Do you find the arcing of four letters to a word around two other words in X-2001?

By Mr. Edmonds:

The witness has said the arcing wasnt there.

A. Here are four letters in the word "order." There you find a perfect arcing at the top between the "o" and the "r" (pointing to page 2001).

X105. Q. I am talking about arcing at the bottom of a word clear to something written below.

A. Well, we have no instance of anything being below on this page, except by the same writer, and of course at regular intervals. The writing is made far from the—the writing being far above any writing below, but there we will find a number of places where we find that arcing occurs as a base line. The "zine" on X-2001-C entry, there we have a perfect arc from the "z" to the "e". Here we have one in the figure itself, X-2001-B. There is a perfect arc of greater dimension, greater degree, than appears in the "guanidine" word in question.

X106. Q. But you haven't got three arcs in the same word as you have in this "guanidine" written above the "'D' shoddy," have you?

A. Yes, we have, in "acceleration," where it says "Acceleration very good," on 2001. There we have from the "c" to the "l", from "e" to "a", an opposite curve, in "thio.", one word.

X107. Q. But you have no letters immediately below that which have to be cleared by those arcs in "acceleration"?

A. No; but that would show it was the nature of the writer to create those arcs. Now we have another one in "quinoline," X-2001. We have a decided arc there. We have another one in "acceleration," on

2001. The fact is, this is full of arcs at the base and at the top of the line. "The acceleration very good" —There it looks like a snake or a worm moving right along with an undulating motion.

By Mr. Edmonds:

X108. Q. I neglected to ask you about "CC" at the bottom. That is a photograph made up like the section at the top, namely, a photograph of the action of organic accelerators, at the top of page 2005, and under it the same thing, built up from letters on X 2001?

A. And rephotographed and enlarged, yes.

X109. Q. On looking at "diphenylguanidine" at page 2005, through the microscope, it is evident, is it not, that both of the two "i's" in "guanidine" project below the blue line on the page?

A. It is decidedly below.

X110. Q. And the "d" between them is a little above the level of those two "i's"?

A. The "d" is considerably above the level of those two "i's".

X111. Q. Can you tell which of the two "i's" come down lower, or are they both the same?

A. The one following the "d" I should say goes a little below, if anything.

X112. Q. Both are quite visibly below the line?

A. Definitely, positively below.

X113. Q. There is one more question I want to ask you about the changed "9" on page 2034. In doing the retouching incident to making that into the "2", in accordance with what you have arrived at, as your conclusion as to how it was done, was any

retouching done to the loop of what was initially the "9"?

A. Yes.

X114. Q. Where, exactly, was that retouching done?

A. I suppose I had already testified as to that. At the base of the line, a line has been drawn directly toward and entering into the staff. That is drawn in a horizontal manner with the pen held off to the right, and directly opposite to the way in which the down-stroke was made.

X115. Q. Is there evidence of retouching of the top portion of the loop of the "9"?

A. No.

X116. Q. Will you get your high-power microscope and let Mr. Wooster look at anything he wishes to see?

A. Yes, sir.

(The Court and Mr. Edmonds and Mr. Wooster examined X-2034-E with the microscope.)

By Mr. Wooster:

X117. Q. What is the power of that glass as just set to examine this entry?

A. It is about twelve diameters.

X118. Q. Will you now set it on the other one, the word "guanidine," on 2005?

(The witness does as requested and the Court examines the same.)

X119. Q. What is the make of instrument which we have just used?

A. A Zeiss binocular.

(The Court and counsel also looked through this instrument at the entry on X-2005 of "diphenylguanidine.")

X120. Q. Did you say in your direct examination what the scale of enlargement was of the three photographs, Exhibits "AA", "BB", and "CC"? If not, will you so state?

A. It was as much as I could make it with the bellows I had. About six or seven times larger than the original.

X121. Q. How about Exhibits "DD" and "EE"?

A. About three or four times as much.

X122. Q. That is the one where you collected the letters for "diphenyl" and the words diphenylguanidine" and "guanidine" and "Action of Organic Accel."?

A. Yes, and they are enlarged in the same relative proportion, looking from the side of the column at 2005 and 2001.

X123. Q. What is the scale of enlargement of the sheets, including the cut itself, from X-2001?

A. That is about double the size, or as much as I could make it on an 8 x 10 plate.

By Mr. Edmonds:

At one time, two of the pages in this X-book were out of the book, and their whereabouts were unknown for a period of probably a couple of months; then they were found and were put in the book and are now pasted in here, and both sides, as I understand it, agree that these are the orig-

inal pages, and that Mr. Weiss's handwriting is on this page which was at one time missing. I would like to ask if the plaintiff makes any point whatever of the fact, or will attempt to make any point of the fact, that the pages were at one time out of the book. If they do, I shall have to put on a couple of witnesses who will testify in that connection. I can do that now; or if counsel do not care to state whether they will make any point about that, then I shall let the matter rest for the present.

Mr. Wooster has asked me to stipulate that one deposition taken in the National Aniline Case by the plaintiff might be used here, and to avoid the inconvenience of taking that deposition or bringing the witness here, I agreed to it. If that deposition is to be offered in evidence in rebuttal, then I must meet the situation.

By Mr. Wooster:

There is an issue raised here as to whether or not the words "diphenyl guanidine" were written on that X-book page 2005 before or after the date when "'D' shoddy" was written under it, by Mr. Weiss. The deposition that Mr. Edmonds just referred to is that of Mr. Vaill, who testified in substance that as late as May 18, or thereabouts, 1922, when he examined that book, he had not noticed those words "diphenyl guanidine" on that page, X-2005, and that the purpose of his examination of the book at the time was to find the several references in it to diphenyl guanidine. The plaintiff will offer that stipulated deposition of Mr.

Vaill. Offhand, I do not recall that there is any discussion in that as to who took the pages out, or when they came back, the fact being, as I understand it from the National record, not having been in that case myself, that the X-book pages were searched for up to sometime before the trial, and at or about the time of the trial were returned and put in the book, and the book the way it is now was brought into court. I see no point being raised here about the period when those pages were out.

By Mr. Edmonds:

There is a very definite point, in this respect: The date when this Mr. Vaill saw the book is fixed beyond question, and it is possible to fix by two witnesses who are here beyond any question whatever that the absence of these two pages was noted two days before that day when Mr. Vaill saw the book. So that the pages which he says he would have seen had they been there, and would have seen "dihpenylguanidine" on it had it been there, were not in the book at that time. So I must prove by these two witnesses that the pages were not in the book, if Mr. Wooster proposes to use this deposition of Mr. Vaill, and to make a point of the fact that the pages were out and might have been offered at that time.

By Mr. Wooster:

I propose to offer that stipulated deposition of Mr. Vaill, and it can be considered as preiously offered by plaintiff. I also expect to call other witnesses in corroboration of that.

JOHN YOUNG, a witness called on behalf of defendants, having ben duly sworn, testified as follows:

DIRECT EXAMINATION.

By Mr. Edmonds:

1. Q. You are in the employ of the National Aniline & Chemical Company?

A. I am.

2. Q. And working directly in connection with rubber accelerators?

A. Yes, sir.

3. Q. That has been your business for some time past?

A. Since June, 1921.

4. Q. Does the National Aniline & Chemical Company sell diphenylguanidine?

A. They do.

5. Q. Will you state whether or not the sale of diphenylguanidine by that company preceded or succeeded November 12, 1921?

A. It preceded that date.

6. Q. Were you at the meeting of the American Chemical Society in Philadelphia, early in September, 1919?

A. I was.

7. Q. At that time you were connected with what company?

A. The Firestone Tire & Rubber Company.

8. Q. And associated with whom, in that position?

A. I was chief chemist there at that time.

9. Q. Was Mr. Norman Shepard associated with you?

A. He was working under me.

10. Q. That is the Mr. Shepard who testified in the Dovan suit against the National Company?

A. The same.

11. Q. Was the Kratz paper read at that September 1919 meeting, the subject of discussion between you and Mr. Shepard?

By Mr. Wooster:

Objected to as calling for hearsay, and as incompetent.

By the Court:

It is a mere question as to whether it was discussed, not the subject matter of discussion.

By Mr. Edmonds:

12. Q. Was it the subject of discussion?

A. We discussed the paper after we returned.

13. Q. Immediately after your return from the Philadelphia meeting?

A. Possibly the next day.

14. Q. When Weiss applied to the Firestone Company for employment, and talked with Shepard and filled out the application that has been presented here, was that reported to you at about that time?

A. Yes. I asked Dr. Shepard to interview Mr. Weiss, and after the interview he came back and showed me the application.

15. Q. Now, I show you the 2000-X-book of the Republic Rubber Company. Will you state when you first saw that book?

A. I first saw this on May 4, 1922.

16. Q. Where?

A. In the laboratory of the Republic Rubber Company at Youngstown.

17. Q. When did you see it next after that?

A. On May 8, 1922.

18. Q. Where?

A. In the board room of the National Aniline & Chemical Company, in New York.

19. Q. Did you have anything to do with the sending of that book from Akron to New York between those two dates?

A. When I was at Youngstown on May 4th, I discussed with Mr. Zieme, who was then chief chemist, the records which the Republic Rubber Company had, and he offered to send this book with Mr. Eaton to New York for examination by the National Aniline & Chemical Company.

20. Q. Was that done?

A. That was done.

21. Q. Eaton brought the book from the Republic to New York?

A. Yes.

22. Q. At the time you saw the book when Eaton brought it to New York, who saw it with you?

A. Mr. Barrows and Mr. Replogle were present, as well as myself and Mr. Eaton.

23. Q. Mr. Barrows, who is here present?

A. Yes.

24. Q. You four?

A. Yes.

25. Q. Any others?

A. Not that I recall, no.

26. Q. Do you recall whether or not at the time when you four were examining that book on the date you have named, it was ascertained that something was missing from the book?

A. Yes, I recall that very well. There were two pages missing.

27. Q. Did the absence of those two pages, when discovered at that time, appear to have been known to any one of you, or was it a surprise to all four of you?

A. It was a surprise to everybody.

28. Q. Eaton didn't know it any more than the rest of you?

A. Not that I recall, no.

29. Q. Can you state definitely who discovered the absence of the pages?

A. I believe that Mr. Barrows had the book in his hands when it was being examined, and it was discovered, but I wouldn't be absolutely certain. It was either Mr. Barrows or Mr. Replogle.

30. Q. In turning over the pages, somebody noted that one was missing and called attention to it?

A. Yes, sir.

31. Q. What was done thereafter?

A. It was decided to have this book photographed, to show that the pages were missing.

32. Q. Did you have anything to do with that?

A. I accompanied Mr. Eaton to a photographer, on 42nd Street, New York, where the book was photostated. While Eaton arranged to have the pictures made, the book was in his possession.

33. Q. The book remained in Eaton's custody throughout the whole time, so far as you know?

A. Yes. Mr. Eaton and myself both waited in the room while the book was being photographed.

(No cross-examination).

FRANK E. BARROWS, a witness called on behalf of defendant, having been duly sworn, testified as follows:

DIRECT EXAMINATION

By Mr. Edmonds:

1. Q. State your residence and occupation.

A. I reside in Glenwood, New Jersey. My occupation is attorney at law.

2. Q. Your firm is attorney for the National Aniline & Chemical Company?

A. Yes; it has been for several years past.

3. Q. You heard Mr. Young say about a meeting at the National Aniline & Chemical Company's office in May, 1922. Do you recall that meeting?

A. Very well, indeed.

4. Q. You were present?

A. Yes.

5. Q. Who else was present?

A. Mr. Replogle, Mr. Eaton and Mr. Young.

6. Q. Will you state what the date was?

A. May 8, 1922.

7. Q. Can you fix the date of that meeting beyond any question whatever?

A. Positively.

8. Q. By reference to what?

A. To my time-sheet entries showing the work which I was doing in my office on that date.

9. Q. I am advised by counsel for plaintiff that they will not question the date when that occurred. Is it your recollection that those present at that meeting were you, Mr. Replogle, Mr. Young and Mr. Eaton?

A. That is correct.

10. Q. Will you state what occurred at that meeting with reference to the examination of the Republic 2000 X-book, and finding that certain pages were absent?

A. I might preface that by stating the reason for this meeting and for the examination of the book. When the Weiss patent here in suit was granted, the National Aniline Company was manufacturing and selling D. P. G., and was in the position of an infringer of this patent. The Dovan Company approached the National Aniline Company, seeking to have that company take a license and pay a large sum of money for it.

11. Q. I would omit any detail of that unless you think it necessary.

A. I was asked by the company as to the validity of the patent, and for advice as to what action they should take regarding it, and in the course of the investigation which I immediately started, I obtained the file wrapper of the patent from the Patent Office, and learned from it of the work that Weiss claimed to have done at the Rubber Company in 1919, and immediately had an investigation started to check up his work. On learning that Mr. Eaton

was familiar with it and knew of the records, I arranged to have Mr. Eaton come to New York for a conference and bring the records with him. At that conference, I personally examined with the greatest care another X-book, so far as the entries had any date relevant to the work of Mr. Weiss or his predecessors. I went over this book page by page with Mr. Eaton, and had him explain the names of substances that I did not recognize, and we looked particularly for records that Mr. Weiss made prior to the date of the Kratz paper of September, 1919. I recall very distinctly that we found only three entries prior to that date, and one of these entries had evidence of a change of date—

By Mr. Wooster:

I object to that. This gentleman is of counsel in this case, and he seems to be giving a brief here instead of answering the question that he was asked. I move to strike this answer out.

By the Court:

Yes, a good deal of that is not responsive, and we will strike it out. You may renew your question, if necessary, Mr. Edmonds.

By Mr. Edmonds:

12. Q. Will you state the circumstances in connection with this meeting at the office of the National Company, when it occurred, who was there, and what happened in the way of discovery that certain pages of the book were missing?

A. This meeting took place at the office of the National Aniline & Chemical Company, New York.

It began in the morning and continued most of the forenoon of May 8, 1922. It had been arranged for by myself, through the National Aniline & Chemical Company, in order to obtain information about the work of Weiss at the Republic Rubber Company, to check the allegations that Weiss had made in affidavits filed in the Patent Office during the prosecution of his application for the patent in suit. There were present at this conference, Mr. Eaton, an employee of the Republic Rubber Company, who brought with him the 2000 X-book, Mr. Replogle and Mr. Young, of the National Aniline & Chemical Company, and myself, who at that time had been asked for an opinion on the validity of the Weiss patent. My examination of this book was for the purpose of obtaining information to advise the company. I examined the book carefully, page by page, and had Mr. Eaton explain to me terms that I did not recognize, and carefully noted the dates, and looked particularly for entries by Weiss relating to diphenylguanidine prior in date to the Kratz paper of September, 1919.

I found on page X-2006 one such entry, and at the bottom of the page a cross-reference to X-2005. I looked to see what the entry on X-2005 was, thinking it might be diphenylguanidine, and I found there was no such page in the book, that the immediately preceding page was X-2004. Then it occured to either Mr. Replogle or myself—I forgot which—to again examine and see if any other pages were missing. This we did throughout the entire book, page by page. I noticed that page X-2008 was also missing. We noticed also that these two pages were part

of the same sheet on opposite sides of the stitching by which the leaves were held in the book. So that the sheet itself as a whole was missing.

I have a very definite recollection of the circumstances surrounding this discovery.

13. Q. I wish you would fix the date in a way that fixes it very definitely.

A. I fix that date by my time-sheet entry, showing the conference with Mr. Eaton and Mr. Replogle, and by a letter which I dictated that same day, late in the day, dated the following day, in which I stated the circumstances of the conference in detail.

14. Q. Have you got a copy of that letter with you?

A. I have both the original, which I obtained from the files of the National Aniline & Chemical Company and our file copy from our own files, in our own office.

15. Q. Is there any reason why the original should not be offered in evidence?

A. None that I know of.

By Mr. Edmonds:

I offer in evidence the letter just identified by the witness as Exhibit "FF."

By Mr. Wooster:

I concede the date of the letter, but I object to the letter as a whole, and the contents thereof, as wholly self-serving.

By Mr. Edmonds:

Will you concede that the conference took place.

By the Court:

There is an admission that there was a conference on that particular date. We will sustain the objection and note an exception.

By Mr. Edmonds:

I would like to withdraw the exhibit, if that concession has been made. I do withdraw that exhibit.

By Mr. Edmonds:

16. Q. Did you have anything to do with the photographing of the X-book, as has been stated?

A. It was at my request that the photographs were made, and I arranged to have them made at the 42nd Street Commercial Studio, which makes most of the prints for our office.

17. Q. Have you got with you the photostats that were made at that itme?

A. I have one set, one of the five sets that were made. We had two complete negative sets of the first seventy-eight pages, and three positives.

18. Q. Does that photostat that you have show that the page 2005 was missing?

A. It does not show it as to X-2005, because that sheet was torn apart for use in the preliminary injunction proceedings which subsequently took place, and where we used that page attached to one of the affidavits. The page was subsequently reassembled in the book, but page X-2007, the original print show-

ing that the page was missing, is in the same form it was at the time the photostat prints were made. These prints had been in our office prior to the National Aniline trial, for a court exhibit in that trial, and have been in our office, under my personal custody, since that time.

19. Q. How does the photostat show that page 2008 was missing?

A. It shows on one side of X-2007. On the other side of the sheet it shows X-2008 as it now appears in the X-book, when 2008 has been returned to it.

20. Q. Does one photographic copy of the X-book show page 2007 and no page returned. It was a page from 2007. Is that a fact?

A. It shows 2007 was on the opposite side, or is now opposite, X-2008.

By Mr. Edmonds:

I do not think it is necessary to present that in evidence, but I submit it for the inspection of counsel for the plaintiff.

21. Q. Now, will you state how long after that date, when the pages were discovered to be missing, they continued to be missing?

A. I had occasion to examine this book again very carefully on June 2 or June 3, 1922, at a time when a motion for preliminary injunction had been brought, and we were required to show cause why that motion should not be granted. I went to Youngstown and there examined the book, and spent most of the day conferring with Mr. Eaton and Mr. Zieme, and prepared an affidavit for Mr. Eaton as

the result of that conference. In the course of that conference, I had occasion to go over the X-book carefully, and I know that the same page, X-2005, was missing from it at that time.

22. Q. Was the absence of the page a subject of discussion at that meeting?

A. Very much so, and it was a subject of discussion from the standpoint of the affidavit and the fact of its being missing was included in that affidavit as the result of my personal observation of the book at that time.

23. Q. Have you fixed that date?

A. I fixed that date by reference to my time-sheet, showing that I was in Youngstown at that date, and that I had a conference with Mr. Eaton and prepared the affidavit on that date.

By Mr. Edmonds:

Perhaps Mr. Wooster will be good enough to concede that date is correct.

By Mr. Wooster:

Yes.

(No cross-examination).

By Mr. Edmonds:

Mr. McWhorter reports, in answer to the request of counsel for plaintiff, that tube-A, produced by him in the course of his testimony, was found to weigh one pound and seven and three-quarter ounces, and that tube-B was found to weigh one pound eleven and one-half ounces, without the valves.

ERNEST R. BRIDGEWATER, a witness called on behalf of defendant, having been duly sworn, testified as follows:

DIRECT EXAMINATION.

By Mr. Edmonds:

1. Q. Will you state the place of your residence?

A. Wilmington, Delaware.

2. Q. And your occupation?

A. Chemist.

3. Q. In the employ of what company?

A. The Du Pont de Nemours Company.

4. Q. How long have you been in that employ?

A. About a year and nine months.

5. Q. Will you state your employment prior to that?

A. Prior to that, I was with the Firestone Tire & Rubber Company, in charge of , prior to that, tire compounding, and prior to that with the B. F. Goodrich Rubber Company, in charge of hose and belting compounding.

6. Q. For how long?

A. For about two years with the Firestone Company, a little over two years, and for about three years with the Goodrich Company.

7. Q. When did you graduate from college?

A. In 1918.

8. Q. Since then, has all of your work been connected with the rubber industry?

A. With the exception of a brief period when I was in the service.

9. Q. You took a degree in Chemistry?

A. I did.

10. Q. And the chemistry of rubber has been your special field of activity?

A. That is right.

11. Q. Will you state what a disubstituted guanidine is?

A. It is a compound which contains a guanidine nucleus and in which two of the hydrogen atoms have been replaced by another group.

12. Q. Will you state as well as you can how many disubstituted guanidines there are?

A. I don't know how many there are; probably not more than 100 have ever been prepared—I should say between 50 and 100. Of course, there would be many times that many possible disubstituted guanidines could be prepared if there were any occasion for it.

13. Q. Many hundreds of them?

A. Yes; I should say 500 or 1000.

14. Q. It appears that some disubstituted guanidines are accelerators of rubber vulcanization?

A That is right Some of them are very good accelerators

15 Q. Are all of them accelerators with rubber?

A. No, they are not.

16. Q. Will you name some of them that are not?

A. A few which have been tested in my laboratory and which are not, are dicarbethoxyguanidine, hydroxymethylcyanoguanidine—

By Mr. Wooster:

I object to this line of examination as not an issue involved in this case. The proof here is that the defendant used diphenylguanidine and it is not denied that that is a disubstituted guanidine, and therefore I think it is entirely immaterial and outside the issues in this case for an expert like this witness to say what other disubstituted guanidines may or may not be accelerators in the vulcanization of rubber.

By Mr. Edmonds:

This plaintiff has notified the defendant, as stated here in court, that it relies in this suit not only on the claims of this patent that cover diphenylguanidine, but also on certain other claims that are stated to cover all disubstituted guanidines, and for that reason we are certainly at liberty to present defenses applicable not only to these broad claims as well as to defenses applicable to the whole patent. In other words, the choice rested with plaintiff as to what it would prosecute this defendant on, and it made its choice, and now has to abide by it.

By Mr. Wooster:

The simple fact is that diphenylguanidine is a disubstituted guanidine, and therefore the defendant infringes the claim covering the disubstituted guanidine accelerator, not merely any disubstituted guanidine. It is also admitted that the defendant specifically uses diphenylguanidine, and therefore it infringes a disubstituted guanidine accelerator claim. Defendant is not here

for either using or making diphenylguanidine generally, but using it as a rubber accelerator and making the resultant product. He didn't choose to use other things that this witness and the art generally knew of that they make without disubstituted guanidines. I think your Honor should exclude all of this.

By the Court:

In order to save time, we will admit this and rule upon it later.

A. Dibenzoylguanidine; bi-thio-carbethoxyguanidine; di-sulphophenylguanidine; di-nitro-dibenzoylguanidine. That is all of the disubstituted guanidines which I happen to have tested and which are not accelerators.

17. Q. So that you have now named six substances that are disubstituted guanidines and are not accelerators of rubber vulcanization?

A. Yes.

18. Q. There has been some reference in this record to diarylguanidines, why I am sure I don't know, because there is nothing stated about it in the patent; but because of that, I wish you would state whether all of these six substances that you have named are or are not diarylguanidine?

A. Five of them are not, one, disulphoguanidine is.

19. Q. I show you Defendant's Exhibit "O," a translation of a magazine article of Duboc. Have you examined that, and if so, state what it is, what it covers?

A. Yes, I have read this article. It is one pub-

lished by Duboc, who is the editor of Le Caucho uc et Guttapercha, which is the leading French magazine on rubber. It is a general review of vulcanization accelerators, referring chiefly to guanidines and guanidine derivatives, and mentioning a large number of compounds of this class, which Duboc states have been investigated and found to be accelerators.

20. Q. This article refers in a long list of guanidines and guanidine derivatives that are said to be accelerators, to a substance diaminoguanidine?

A. Yes, sir, that is right. I noted that reference.

21. Q. Will you state what you know about the accelerating value of this substance?

By Mr. Kennedy:

So as to save the time of the Court, yesterday, in the course of the examination of the witness McWhorter, anticipating, and in fact knowing then, that tests would be referred to, I noted on the record an objection that I note here, and which may run without repetition, I assume, to any testimony here by this witness as to so-called ex parte tests. As I stated here, we were not invited to be present at any such tests, and they were not conducted in our presence.

By the Court:

We will admit them subject to your objection.

A. Yes. I have tested diaminoguanidine, using it in the form of its bicarbonate salt, since the free base is unstable, and I find it to be an accelerator.

I have here a record of that test. The compound which I have tested will not vulcanize in sixty minutes at 286 degrees Fahrenheit, in the absence of an accelerator; but in the presence of the bicarbonate salt, of diaminoguanidine, it had a tensile strength of 1410 pounds, when vulcanized for 60 minutes.

22. Q. Are you now referring to a record of the test you made with diaminoguanidine?

A. I am.

By Mr. Edmonds:

I offer this record in evidence as Exhibit "GG."

By Mr. Wooster:

The same objection is made by the plaintiff.

By the Court:

This is all in the line of tests. The objection is overruled and exception noted to plaintiff.

By Mr. Wooster:

I desire to further state that the Duboc article referring to diaminoguanidine is pleaded as anticipatory in the answer. This witness has just stated that he did not test that substance, but did test the bicarbonate salt of diaminoguanidine, whatever that may be. That matter is not pleaded in the answer, and plaintiff objects, on the ground that it is entirely outside of any issue raised here in the pleadings.

By Mr. Edmonds:

23. Q. Will you state why it was—

By the Court:

He has already stated.

By Mr. Edmonds:

24. Q. What was it that led you to try to test this unstable compound in the form of this bicarbonate salt?

By Mr. Wooster:

I make the same objection. He is now trying to build up the publication beyond what it shows on its face.

By the Court:

The objection is overruled and exception noted.

A. In the first place, that is the usual way of handling unstable chemicals in the form of a salt which will decompose, producing the pure chemical at the proper time; that is, in this case, when the rubber is heated for vulcanization. However, if I had not known that—I recall that Twiss, in an article published at about the same time mentioned tests on aminoguanidine as an accelerator, and stated that he used it in the form of its bicarbonate salt, because the free base was unstable.

By Mr. Wooster:

I make the same objection to that, as aminoguanidine is not a disubstituted guanidine; hence, outside any issue proposed to be raised here.

By the Court:

This last is a mere illustration.

By Mr. Edmonds:

25. Q. The Twiss article, to which you refer, is Exhibit "O" in this case?

A. Yes, it is.

26. Q. Have you got test sheets similar to Exhibit "GG," with reference to tests that you made on each of these substances that you told about, which you said were disubstituted guanidines and not accelerators?

A. I have. Here they are.

By Mr. Wooster:

I make the same objection.

By Mr. Edmonds:

27. Q. Does each of these bear the date when you made the test?

A. They do.

By Mr. Edmonds:

I offer in evidence the test sheets just referred to by the witness, to be marked Exhibit "HH."

By the Court:

The objection heretofore made by the plaintiff is overruled and exception noted.

RECESS.

AFTERNOON SESSION.

Wednesday, October 14, 1925.

E. R. BRIDGEWATER resumes the stand.

DIRECT EXAMINATION (Continued)

By Mr. Edmonds:

28. Q. Will you look at the 2000 X-book of the Republic Company, page 2006, and note the test recorded there in the column labeled H, and state whether or not the test recorded there as made on the date indicated would have indicated to the man who made the test that there was any superiority of D. P. G. over T. P. G.?

A. May I refer in answering that question to other tests shown on the same or preceding page?

By Mr. Wooster:

Objection. That entry should speak for itself, and it should not be necessary to bring in extraneous evidence of *ex parte* tests made by this witness, without invitation to plaintiff.

By the Court:

Your objection is to the first question asked, that is, as to what the test would indicate?

By Mr. Wooster:

My objection is that the witness should testify from what he sees in the book, not from something else he did outside of the book.

By Mr. Edmonds:

That is what the question asks him to do.

By Mr. Wooster:

Then the witness asked if he could refer to his own tests.

By the Court:

No; I understood him to say other tests in the book.

A. I find on page X-2005, column H, a test on a formula, which is the same as the one shown on X-2006, column H, excepting that the one on page X-2006 contains 2 per cent of diphenylguanidine, while the one on page 2005 contains no other accelerator, excepting one per cent of lime. There is also a difference of 2 per cent in the barytes content, which was apparently made so that both of the formulas would add up to 100, barytes being an inert filler. It appears from these tests that the addition of 2 per cent of diphenylguanidine produced an increase of the tensile strength of 105 pounds. I also find on page X-2006, column blank—it is not numbered—a test on a formula of approximately the same general nature as the one I just referred to. The difference is that 5 pounds of rubber and 20 pounds of barytes are replaced by 23 pounds of additional shoddy. There is also a difference of 1 per cent in the sulphur content.

By Mr. Wooster:

29. Q. More or less sulphur?

A. There is more sulphur in the compound I referred to now than in the one I referred to previously. In column B on X-2006 are shown tests on this same formula, with 3 per cent of triphenylguani-

dine in place of 3 per cent of litharge. Litharge is a popular inorganic accelerator. The replacement of 3 per cent of litharge by 3 per cent of triphenylguanidine resulted in an increase in the tensile strength from 430 pounds to 730 pounds, or a net increase of 300 pounds. I should certainly say, from the fact that replacing litharge by triphenylguanidine produced this large increase in tensile strength, while in a very similar compound adding diphenylguanidine and not taking out any other accelerator produced an increase in the tensile strength of only 105 pounds, triphenylguanidine was a better accelerator to use in this type of stock than diphenyl. basing my conclusions, of course, only upon the tests and conditions of vulcanization recorded on these pages.

By Mr. Edmonds:

30. Q. Is this conclusion that you have expressed drawn from only what is recorded on these pages you have referred to, verified by any tests that you yourself have made; and if so, state what they are?

A. The conclusion that I have just drawn was made without reference to any test that I have made. I have, however, made tests on this same compound shown on page X-2006, column H. Inasmuch as C-shoddy was made only by the Republic Rubber Company for their own use, and is not now available, I inquired of Mr. Seth Clark, who was manager of the development department at the Republic Company at the time these tests were made, what present day shoddy would be its equivalent. He informs me that Philadelphia No. 69 is made from the same

scrap, and he judges it to be substantially equivalent. I therefore used Philadelphia No. 69 in repeating this test. I find that this compound has an average tensile strength, when vulcanized under conditions indicated in the X-book, of 712 pounds per square inch, which checks the results shown in the X-book, 720 pounds per square inch, very well—remarkably well.

I also tested this same compound, leaving out the accelerator altogether, and making no other change. I have here a test sheet marked "Ed-1," showing the result of my test on the compound as it appears in the book, and a sheet marked "Ed 1-A," showing result of my test of the compound with the diphenylguanidine left out. With the diphenylguanidine left out, the tensile strength is slightly lower, 663 pounds, but within the limit of experimental error.

I also tested this same compound, replacing the 2 per cent of diphenylguanidine by triphenylguanidine. The result of this test is shown on the sheet which I have here, marked "Ed-1B." This compound has an average tensile strength of 756 pounds, which is higher—but still within experimental error—than the result reported in the X-book. I conclude from these tests that this test could not have indicated to anyone that D. P. G. was a better accelerator for use under these conditions and in this stock than T. P. G.; or, for that matter, the compound containing the D. P. G. better than the one containing no accelerator at all.

By Mr. Edmonds:

The test sheets just referred to by the witness are offered in evidence as Defendant's Exhibit "II."

By Mr. Wooster:

Same objection, and exception.

By the Court:

By that you simply mean you object to the use of any test at all, and not to the fact that the test was made pursuant to hearsay testimony as to the components. I was looking for an objection upon that ground, and would have sustained it on that. If you simply make the subject matter of your objection the introduction of any testimony as to tests of those formulas, I would overrule your objection. I think, if there is objection made to it on the other ground, I will have to sustain it.

By Mr. Edmonds:

On what grounds, if your Honor please?

By the Court:

On the ground that he took other material which a third party informed him was substantially the same. Until the ground were laid, that would not be competent at all.

By Mr. Wooster:

If your Honor please, I intended to raise that objection after cross-examination of this witness.

By the Court:

But after the thing is once admitted, it is admitted on the face of the situation as it exists at the time it is offered, and a motion to strike out does not quite cover the same ground. If the objection is made now, though, I will have to grant it.

By Mr. Edmonds:

May I say a word on that, if your Honor please? This C-shoddy that was used in the Republic Company away back in 1918 is a thing that is not obtainable at the present time. You can't buy it from the Republic Company or anyone else, so the witness had no choice—

By the Court:

That is all right about that part of it. He would have to take what he had to make it, but if he has no knowledge of the identity of that with which he replaced it, and there is no evidence of the substantial identity, then the test is worthless, so far as a matter of proof is concerned.

By Mr. Edmonds:

Now, this information that he referred to as having got from Mr. Clark, he is right here and of course can be put on the stand, if that is the only ground of objection to the testimony. I have no doubt, though, that Mr. Wooster would concede that if Mr. Clark were put back on the stand, he would say that to the best of his knowledge this Philadelphia shoddy number so-and-so is the same as the Republic Company's C-shoddy.

Now, I would like to put Mr. Clark on the stand, if you make any point about that. Of course, Mr. Clark can only give his opinion, but it is a pretty accurate opinion, because he is a man that is pretty accurately familiar with it.

By the Court:

Of course, he would have to show his familiarity with the other.

By Mr. Edmonds:

He is sufficiently familiar.

By the Court:

If there is a definite offer placed upon the record to establish by a competent witness who had knowledge of the identity of the two products, I will accept it out of order, overruling the objection—of course, with leave to counsel to renew the objection in case the offer is not sustained.

By Mr. Edmonds:

I do make that offer right now. Mr. Clark is here present, and can take the stand at any minute and tell all about it. I would like to omit some of these very minute matters; it would help us to get along a little faster.

By Mr. Wooster:

Plaintiff objects to the answer, as hearsay, and also repeats the objections and exceptions heretofore taken as to the weight to be given ex parte tests. If Mr. Edmonds desires to examine Mr. Clark on shoddy, he may do so.

By Mr. Edmonds:

I will have to do so, though I hate to use the time on such things.

By Mr. Wooster:

I move to strike the answer out.

By the Court:

In view of the offer to follow this by proof as to the identity of the shoddy used in the test with that formerly used by the Republic Company under the name of C-shoddy, I shall overrule the objection, noting an exception to the plaintiff; of course permitting the plaintiff's counsel the right to further object, in case that offer be not met by the testimony.

By Mr. Edmonds:

31. Q. Now, Mr. Bridgewater, will you consider the test on shoddy recorded in column A on page 2042, and state whether you have made a similar test there, and what conclusion you have drawn?

A. Yes, I made similar tests on the compound shown on page X-2042, column A. I have here test sheet marked "Ed 2," showing the result of that test. This compound has a tensile strength of 620 pounds per square inch, which is the same as that shown in the X-book. I also tested this same compound in the absence of any accelerator, excepting lime, and find that it then has a tensile strength of 487 pounds per square inch. This test is shown on the sheet which I have here, marked "Ed 2-A." I further tested the same compound, replacing the diphenylguanidine by triphenylguanidine.

The result of this test is shown on the sheet which I have here, marked "Ed 2-B." In this case it is apparent that the diphenylguanidine improved the quality of the rubber over what was obtained without any accelerator at all, but it is equally apparent that under the conditions of vulcanization which are shown at the bottom of this column A, T. P. G. gives a still further improvement. I would conclude from this that no conclusion could be drawn which would show any advantage of D. P. G. in this compound over the previously known T. P. G. One who was familiar with the effect of T. P. G. in this compound would have recognized this as a poor result, and, of course, attribute the quality of the result to the accelerator use.

By Mr. Edmonds:

I offer in evidence the test sheets to which the witness has just referred, as Defendant's Exhibit "MM."

By Mr. Wooster:

Same objection and exception, and motion to strike, by plaintiff.

Now, in that one there seemed to be a different shoddy used there, as I understand it.

By the Witness:

May I add to my answer an explanation of that—I neglected to do so.

By the Court:

You may.

By the Witness:

In making these tests I used Philadelphia Lehigh Reclaim in place of the G-shoddy, G-shoddy being no longer available, and since I am informed by Mr. Clark that Philadelphia Lehigh is substantially equivalent to the G-shoddy which the Republic Rubber Company was producing in the early part of 1919.

By Mr. Wooster:

I object to this last statement, as hearsay, and move to strike it out.

By Mr. Edmonds:

I note on the record that this is to be followed by a statement of Mr. Clark as to the equivalency of the shoddies referred to.

By the Court:

In view of the offer, we make the same ruling as with regard to the other test.

Exception noted to Plaintiff.

By Mr. Edmonds:

32. Q. Mr. Bridgwater, when Mr. Whitby was on the stand he referred at some length to the various advantages of D. P. G. and T. P. G. in rubber acceleration. Will you state your views on that subject?

A. Yes, I will.

By Mr. Wooster:

(To the witness): Don't read from notes, please.

A. (Continuing) I am requested by Mr. Wooster not to refer to notes. I have notes before me concerning a number of statements which Mr. Whitby made, and upon which I wish to express my opinion. I am afraid I cannot recall all the points he made, many of which I do not agree with, without reference to notes.

By Mr. Wooster:

33. Q. You may use the notes for points, but not to read your answer from.

A. Dr. Whitby stated that "it"—referring to diphenylguanidine—"that various advantages as a commercial matter aside from those effected in vulcanization which I think no other accelerator available at that time possessed in the same measure." Dr. Whitby is mistaken in this. Triphenylguanidine has all of these advantages in equal or greater degree. Specifically, he says, diphenylguanidine is not poisonous; neither is triphenylguanidine. He also states that diphenylguanidine is insoluble in water, and can therefore be used in open steam cures; triphenylguanidine is equally insoluble in water,—although, as a matter of fact, it is not essential that an accelerator which is to be used in open steam cures be insoluble in water. Hexamethylenetetramine is very soluble in water, and has been used in open steam cures, especially inner tubes, for the last eight years at least, and is still so used by many of the largest rubber companies. He also states that D. P. G. is soluble in rubber, and therefore disperses well. This is likewise true of T. P. G. to an equal degree. He states that D. P. G. is stable and can be kept indefinitely. The same statement is true of T. P. G.

He states that D. P. G. does not take up water from the air. The same statement is true of T. P. G. He states that D. P. G. is a powder, and therefore agreeable to the rubber compounder. So is T. P. G. a finely divided powder. He also states that D. P. G. is a definite substance, having a definite melting point and is therefore easy to identify and check its purity. The same statement is true of triphenylguanidine. Dr. Whitby then stated that diphenylguanidine does not discolor rubber, and is therefore a good accelerator for producing white stocks. The same statement is true of T. P. G. He also said, or at least implied, that diphenylguanidine has less tendency to cause scorching of the mixing rolls and in other factory operations than the other accelerators which were known prior to 1919. This is exactly contrary to the facts. Diphenylguanidine has distinctly greater tendency to cause scorching than T. P. G., hexamethylenetetramine or paranitrosodimethylanilin,—to mention a few of the most widely used accelerators at that time. Dr. Whitby also stated that D. P. G. increased the strength, elasticity and texture of vulcanized rubber. He defines "strength" as stiffnes or toughness, and adds that this improvement in these properties will result in a rubber with better wearing qualities and resistance to operation as applied to a tire tread. Now, this is undoubtedly true as applied to a compound containing diphenylguanidine compared with compounds containing no accelerator at all. The statement as worded in his testimony, however, might have the effect, or might be taken to mean that diphenylguanidine gives better wearing rubber, stronger and more elastic rubber, than can be produced with other accelerators which

were known at that time, that is, in 1919. That is not true. For instance, T. P. G. when properly used, produces rubber of equally as high strength, elasticity and general wearing qualities as D. P. G., provided they are used in equivalent amounts. The fact that large quantities of T. P. G. are still used in the highest grades of rubber products is the most impressive confirmation of that fact. According to the figures of the United States Tariff Commission, there were 428,000 pounds of T. P. G. used in this country last year. The consumption this year will be at least 100,000 pounds greater. One large rubber manufacturer, with whose compounding practice I happen to be familiar, could save $15,000 per month by substituting diphenylguanidine for triphenylguanidine, which is now being used. He has, however, not made this change, because the shorter period of cure which is characteristic of diphenylguanidine stocks would be disadvantageous in the particular product for which he is using this accelerator. Another reason for not making the change, in spite of the possible saving, is that—as I just mentioned—diphenylguanidine has a greater tendency to cause scorching than triphenylguanidine has. There is no advantage for this manufacturer in making such a change, because his product already enjoys an unexcelled reputation in the trade.

Dr. Whitby did not state that the use of diphenylguanidine diminishes the tendency of rubber to deteriorate with age, but he did state that the patent claims that. To avoid any misunderstanding, I should like to say that it is well recognized that T. P. G., for instance, is fully equal to D. P. G. in that re-

spect. Now, there is one property of D. P. G. in which it is superior to T. P. G., or in fact any other accelerator which was known in 1919. I refer to its accelerating activity. Being a much more active accelerator, it can be used in smaller amounts to produce the same accelerating effect, and since there is but little difference in the cost per pound it is far cheaper to use diphenylguanidine. It is also generally true that the more active accelerators will effect vulcanization in the presence of smaller amounts of sulphur than the less active ones. These advantages which arise out of the greater activity of diphenylguanidine are the only advantages which diphenylguandine has over triphenylguanidine. I refer to triphenylguanidine throughout this discussion, since it is the most closely related to diphenylguanidine of the accelerators which were known prior to 1919.

By Mr. Edmonds:

34. Q. Are you familiar with the uses of diphenylguanidine and triphenylguanidine in the manufacture of hard rubber; and if so, state what the action of the two is in that particular.

A. In the manufacture of hard rubber, diphenylguanidine is of course a more economical accelerator to use, on account of its greater activity. As far as the finished product is concerned, there is no difference at all.

By Mr. Edmonds:

I wish to state on the record that the witness has here rubber slabs made in the course of all of these tests that he has referred to in his testimony, and covered by the test sheets that

have been offered in evidence. I am perfectly willing to offer these in evidence, if my adversary wishes to have it done, but I don't believe it will serve any purpose; but I merely state they are here for examination, if anyone wants to examine them.

The witness also has here samples of these disubstituted guanidines that he referred to, and they are available for inspection.

35. Q. I would like to ask you one further question. Does this chart (indicating) give the chemical formula for these disubstituted guanidines that you referred to—the six disubstituted guanidines that are not accelerators?

A. It does, and it also gives the formula for diphenylguanidine and for guanidine itself.

By Mr. Edmonds:

I offer this chart in evidence, as it may be of some assistance to us, as Defendant's Exhibit "NN".

By Mr. Wooster:

Same objections to the chart as to the examination in relation to the alleged disubstituted guanidines not involved here, and the same motion to strike out.

Objection overruled.

Exception noted to Plaintiff.

CROSS-EXAMINATION.

By Mr. Wooster:

X36. Q. You referred to the diaminoguanidine, and stated that you did not have the free base. Did you try to make it?

A. We produced the free base, but it decomposes within—I don't remember the exact time, but within half an hour or something like that, so that immediately upon producing it it must be stabilized by converting it to the bicarbonate salt, which is the best available means to prevent decomposition.

By Mr. Wooster:

I object to that answer as irresponsive and volunteered, as I did not ask anything about stabilization, and move to strike it out.

Motion allowed.

(Question read.)

A. Yes.

X37. Q. You couldn't do it, could you?

A. We did make it.

X38. Q. How do you know you made it?

A. We feel quite certain that we made it, because the process which we used could not have resulted in anything else than that.

X39. Q. Did you make the carbon, hydrogen and nitrogen determinations of it?

A. No.

X40. Q. Did you take the molecular weight of it?

A. No.

X41. Q. Did you take the melting point?

A. No.

X42. Q. Did you weigh it?

A. No.

X43. Q. Specific gravity?

A. No.

X44. Q. What did you do to satisfy yourself that you had it?

A. Nothing.

X45. Q. Are you aware of any references in the literature that say that diaminoguanidine base is unstable and cannot be isolated?

A. I am not certain of the last three words you used, but I do recall references to the fact that it is unstable, and those words may also have been used.

X46. Q. What reference do you recall?

A. I don't know that I can remember. It was some time ago that we made this material. You probably have the same one. We looked it up in the standard reference books.

X47. Q. Is Thorpe's Dictionary, 1912 Edition, a standard reference work?

A. It is considered by some to be. I wouldn't use it for Organic Chemistry myself.

X48. Q. Do you agree with this statement, taken from page 11, of that book, under "Diaminoguanidine," after the formula, "does not exist in the free state."

A. I am afraid I cannot either agree or disagree with that, the point being it certainly must exist a long enough time to permit of its identification.

X49. Q. Then you disagree with that statement?

A. Yes, I do.

X50. Q. Is it not necessary, in definitely identifying organic chemicals or compounds of the nature

of accelerators we are here dealing with, that very careful determinations of hydrogen, nitrogen and carbon content be made?

A. Not those determinations—certainly not carbon. Hydrogen and nitrogen are often determined, and of course melting points and boiling points, and so on.

X51. Q. As a fact, did you not guess that you had diaminoguanidine?

A. No, not at all, because we did make accurate determinations upon the bicarbonated salt, and they indicated that the material which we had before adding the bicarbonate must have been diaminoguanidine.

X52. Q. Will you state the process by which you did this?

A. Made the material?

X53. Q. Yes.

A. By the addition of cyanogen chloride to hydrazine, and precipitated it.

X54. Q. Then what did you do?

A. Then we got a substance which we judged to be diaminoguanidine, which we found was unstable, and so we made another preparation, and as soon as the first reaction was completed, added the bicarbonate, which produced the bicarbonate salt, which we dried and tested. It required no purification, since there are no by-products, except water.

X55. Q. So that according to your own experiments, you did not obtain diaminoguanidine base in the free state, did you?

A. I believe that we did, yes.

X56. Q. Did you obtain it so that you could do anything with it?

A. No, we did not, because it is unstable.

X57. Q. You couldn't make a cure in rubber with it, could you?

A. No, I don't think we could. We didn't try, as a matter of fact.

X58. Q. Did you make an effort to?

A. No. As a matter of fact, we found reference in the literature to its instability before we got very far, and realized it was not to be used in a rubber that way.

X59. Q. Your diaminoguanidine carbonate is an acid salt, or base, or whatever its parent is, is it not?

A. That is a pretty fine point in chemical nomenclature. You might say that sodium bicarbonate is an acid salt, and still you know as well as I do that sodium bicarbonate is a strong alkali. The same holds true with this. Bicarbonate salts are technically, according to one system of nomenclature, acid salts, but unless they are made with an exceedingly weak base, they usually have a basic reaction.

X60. Q. And bicarbonates generally are relatively easily decomposed, are they not?

A. Yes, that is right. They are easily decomposed.

X61. Q. So that as a general proposition, a bicarbonate derivative of diaminoguanidine would not be expected to be such, if any, more stable than the diaminoguanidine base, would it?

A. No, I think you misunderstand me when I say that bicarbonates are easily decomposed. I mean, they decompose at slightly elevated temperatures. Take sodium bicarbonate, for instance, you can keep it in a bottle for a hundred years, I suppose, but

you heat it up to the temperature of boiling water and it will give off carbon dioxide.

X62. Q. Did you get a decomposing temperature of your diamino bicarbonate?

A. Yes, we did.

X63. Q. What was it?

A. I don't recall what it was.

X64. Q. About what?

A. Oh, I really wouldn't be able to make a guess. As a matter of fact, I didn't make that experiment myself; one of my assistants did. I remember discussing it with him. He was interested in it from a scientific point of view rather than anything else. I didn't feel that it had anything to do with this subject here.

By Mr. Wooster:

In view of the witness's last statement, that he did not make the diamino bicarbonate, his entire testimony in relation to it is further objected to, as secondary.

By the Court:

That is a mis-statement of his testimony, as I heard it. He simply stated, as I understand his testimony, that one phase of this, this test as to the decomposing point, the melting point, was made by his assistant. I may have misapprehended his testimony.

By the Witness:

You are right, Your Honor. I might add, however, that I was assisted in all of this preparation by one of our chemists. It occupied several days. I was not in the laboratory the

entire time. He and I prepared it together. He did most of the manual labor.

By Mr. Wooster:

X65. Q. What did you have to do with the preparation of this substance—you yourself?

A. We discussed how to prepare it, ordered the raw material from which to prepare it, and I saw the operation at several stages of completion, and saw the finished product—saw the product tested in rubber myself.

X66. Q. You mean the bicarbonate?

A. Yes, the bicarbonate; that is the finished product.

X67. Q. Did you personally make any of the tests of the product?

A. No, I did not. I watched one of our laboratory assistants while he was making it himself.

X68. Q. Where you said that bicarbonate react alkalis, or bases, you meant in water solution, did you not?

A. Yes, that was what I had reference to.

X69. Q. Does that apply to solution of accelerators in rubber, you having mentioned some that dissolved in rubber?

A. No, I would be unable to say that any compound acted either as an acid or as a base in rubber. Usually, when we speak of acidity or basicity we refer to the production of—We are getting into technicalities now, but I don't see how I can answer your question otherwise—refer to the production of hydrogen or hydroxyl ions by reaction with water, and the degree of basicity or acidity is measured by the con-

centration of those ions. Now that, whether speaking of basicity or acidity, is largely theoretical.

X70. Q. Now, in your experiments in accelerators, have you tested bicarbonate or other acid salts of organic bases as accelerators?

A. Yes. I have tested the bicarbonate of diphenylguanidine and found it to have substantially the same strength, on a molecular basis, as diphenylguanidine.

X71. Q. What other ones did you test?

A. That is the only one I recall at the moment.

X72. Q. It is not common practice, or commercial practice, in this art to use acid or carbonate derivatives of organic bases as accelerators, is it?

A. Now, let us separate that question into its parts. You say, is it common practice to use carbonated derivatives of organic bases? I believe that one firm placed on the market a carbonate—or bicarbonate, I don't know which—of diphenylguanidine. It has never been widely sold, because there is no demand for it. Diphenylguanidine is stable without resorting to that. Now, is that all your question?

X73. Q. Is not the base more useful than bicarbonate derivative of the base—say, diphenylguanidine, for example?

A. As I recall it, molecular equivalent amounts —that is, containing the same amount of diphenylguanidine—of diphenylguanidine bicarbonate and of the pure base—have equal accelerating effect. Does that answer your question?

X74. Q. In that case, you must regard the addition of bicarbonate as inert, do you not?

A. Yes.

X75. Q. That is not the fact with diaminoguanidine, is it—which you cannot obtain without bicarbonate or some other combination?

A. Why, I have no reason for assuming to the contrary. Of course, there is no way of determining that, because, as I said, diaminoguanidine free base is unstable, so no one could ever make the comparison.

X76. Q. You mentioned a reference in Twiss to aminoguanidine?

A. Yes.

X77. Q. By that did you mean monoaminoguandine?

A. Yes, sir.

X78. Q. What do you know about that substance?

A. I have never tested it. As I recall it, Twiss states that it is unstable, but is a good accelerator when used in the form of its bicarbonate salt. He is a very experienced investigator, and I have no reason to doubt what he says.

By Mr. Wooster:

I will offer that for identification—the page from Thorpe's Dictionary, it to be marked as Plaintiff's Exhibit No. 12.

X79. Q. Now, referring to these tests made by you, how did you come to make them?

A. Which tests do you refer to?

X80. Q. Each of those you brought in.

A. These tests which I made on the shoddy formulas recorded in the X-book were made at Mr. Edmonds' request.

X81. Q. When?

A. I can't tell you just when he made the request.

X82. Q. I mean, when were the tests made?

A. The tests were made on the 17th of September, 1925.

X83. Q. For the purpose of this case?

A. Yes.

X84. Q. From whom did you get instructions or authority?

A. My superior officer, Mr. J. Warren Kinsman, instructed me to give Mr. Edmonds any assistance I could in the matter of making tests, and so forth, in connection with this case.

X85. Q. To whom did you report?

A. You mean, to whom did I report the results of these tests?—To Mr. Edmonds directly.

X86. Q. Do the same answers apply to the tests you made with diamino bicarbonate?

A. Yes, the same answer.

X87. Q. Exhibit "EE". And also does the same answer apply to Exhibit "HH"?

A. Yes, that answer will apply to all of these tests.

X88. Q. Referring to the chart, Exhibit "NN", how did you make the dibenzoylguanidine, which is the one in the upper right corner?

A. I believe I stated that I only tested those compounds. They were made by Dr. Harold Powers, of the Dupont Company.

X89. Q. Oh, you took his say-so that it was dibenzoylguanidine?

A. That is right.

By the Court:

X90. Q. You say you tested this yourself—you mean after—

A. I tested it in rubber, Your Honor.

X91. Q. You assumed the stuff to be what another man told you it was?

A. As a matter of fact, at the same time he gave me melting points, melting points taken from the literature, to compare them with, and in one or two cases nitrogen determinations,—that is, he reported to me the actual results of such tests he had made, to check up on the purity and identify of these compounds. But I did not make any of these tests or witness the making of any of these tests which established the identity. I merely saw the results of the material, and I am in the habit of taking Dr. Powers' word on such matters as that.

By Mr. Wooster:

I move to strike the entire exhibit out, as wholly incompetent, in view of what this witness says—also the testimony with relation to it, particularly these charts of Exhibit "HH".

X92. Q. Who is this man who furnished you with the substance?

A. He is an organic chemist who has worked with me, is working with me, his part being the preparation of organic compounds and my part being the testing of them in rubber.

X93. Q. Is he your subordinate?

A. A subordinate.

X94. Q. Did he do this at your direction?

A. At my request, yes—my direction. I did not, however, tell him the exact procedure to use in

these preparations. He is, for that matter, more competent to decide such things as that than I myself, since his specialty is organic chemistry, and mine is rubber chemistry.

By Mr. Edmonds:

If the Court please, this man works in an organization, and with him is a man who in this particular branch of the work, the preparation of these organic chemicals, is recognized by Mr. Bridgwater and everyone else as having more skill and being more competent than he is himself—

By Mr. Wooster:

We do not.

By Mr. Edmonds:

So he himself would, from the standpoint of accuracy, rather have this other man make these chemicals than make them himself.

By the Court:

Presuming that to be so,—in order to give them a foundation here for evidence, we cannot take all those things into consideration. That is, the witness's idea of the matter.

By Mr. Edmonds:

That is perfectly true, and therefore, if this matter is pressed, it is going to be necessary to take this man out of the laboratory and bring him down here and have him say that he made these substances,—a thing that can be done, but it is a very unnecessary thing to do, when we know in advance he is going to say just exactly

what the man who is working beside him, and who is familiar with all of his work, says he did.

By the Court:

That is yet another question. In the face of objection.—

By Mr. Edmonds:

If the matter is pressed, that is what I shall do,—bring this man down here on the night train and have him here tomorrow morning. But I think that counsel ought not to make every individual thing of that sort necessary.

By the Court:

Well, of course, that is up to counsel.

By Mr. Wooster:

Well, you insisted on putting these in over our objection that they are not an issue in the case and not up for consideration.

By Mr. Edmonds:

Suppose we bring this man here, and he says he made them, it would be perfectly competent to say, "Where did you get the glass of water that you used in this?" and if he happened to say, "I got it from so-and-so, distilled water," it is competent to ask him, "How do you know that was distilled water?" and then we would have to bring another man in here to testify to that.

By the Court:

Of course, the weight of that is another question, but it seems each main subject ought to be taken, and in the face of objection, I am afraid

I must sustain the objection, unless there is an offer to follow by proof. I am free to say that I question the importance, because I think the case will be decided on more general lines, as I grasp it at the present time.

By Mr. Edmonds:

Well, I make the offer to produce this individual, but before sending for him. I shall make another effort to prevail on Mr. Wooster not to make it necessary. I don't think he should, but if he does, then I shall produce him.

By the Court:

In view of that offer to follow with testimony in regard to the chemical furnished the witness by his assistant, we will overrule the motion and note an exception to the plaintiff.

By Mr. Wooster:

X95. Q. Have you ever had any experience in distinguishing guanidines and ureas from each other?

A. I don't quite get the import of your question. I know the difference between a urea and a guanidine, of course.

X96. Q. I mean, have you ever examined a substance to determine whether it was a guanidine or a urea?

A. No, I don't recall that I have ever made a test myself.

X97. Q. In at least some instances, would it not be necessary to make carbon, nitrogen and hydrogen determinations?

A. Oh, I don't think so. The melting points

recorded in the literature—if it was a compound that was recorded of course—

X98. Q. But do you not find melting points of some guanidines very close to ureas of similar chemical structure?

A. Yes, that is right. I suppose you do.

X99. Q. So that the melting point is not a true criterion of the constitution of a compound, is it?

A. No, it is not, where the melting points of other compounds which might be there come close In that case you must resort to nitrogen determinations—about the most accurate elemental determinations you can make, and therefore are very commonly used. A nitrogen determination would be by far the best way to differentiate between a urea and a guanidine, because there is so great a difference in the percentage of nitrogen.

X100. Q. So that in some cases, to differentiate between a urea and a guanidine, you would have to take a nitrogen determination, would you not?

A. Yes, I think you would, in some cases. It depends upon how the melting points come.

X101. Q. Referring to your chart Exhibit "NN", you said one of the substances listed was an arylsubstitutedmonoguanidine?

A. Yes, this is (indicating on chart).

X102. Q. The one marked "disulfophenylguanidine"?

A. Yes.

X103. Q. Why do you say that?

A. Because the hydrogen—or rather, two of the hydrogens are replaced by carbon to an aromatic

ring. "Aryl" means a substitute,—substituted with an aromatic ring—that is where the word comes from. An aromatic ring is a six-membered carbon ring, with or without other constitutents.

X104. Q. You regard the sulphophenyl group as an aryl group?

A. Certainly.

X105. Q. What is the nature of sulfophenyl relatively to phenyl in basicity?

A. The group in general—of course, when we talk about basicity we have to get it into compounds where we can measure basicity—the group in general has more acidic properties.

X106. Q. That is characteristic of groups such as SO_3, OH, NO_2, and others, is it not?

A. No. It is characteristic of SO_3 and NO_2. Of OH I wouldn't want to say that. Take, for example—well, let us take methyl alcohol, that has an OH group, the hydrocarbon constituent, or ethyl alcohol, we don't call those acidic.

X107. Q. I notice in several of your compounds on this exhibit "NN" you have introduced oxygen.

A. That is right, sir.

X108. Q. Did you find any oxygen in diphenylguanidine?

A. No, sir.

X109. Q. Do you think a substitution of oxygen makes any difference in the action?

A. No, I don't think so. A good example of that is dianisylguanidine, which has oxygen in it, and is a more powerful accelerator than diphenylguanidine.

X110. Q. Where is that one mentioned?

A. Well, that is not on that list.

By Mr. Wooster:

I object to that answer, as irresponsive and volunteered, and move to strike it out.

A. Will you repeat the question?

By Mr. Wooster:

He brings in another one now that I have not asked him for. I asked him about this chart.

By the Court:

But the thing is this: A witness on cross-examination is always entitled, of course, to an explanation of his answer, and we cannot be striking out all this matter which the witness may use, which is more or less collateral to the main issue. Here he just simply gives his reason for his answer.

X111. Q. In your direct testimony regarding the X-book, pages 2005-H, 2006-H, 2006-B, and blank column of 2006, did you give the various cures and times of cures?

A. I don't know that I read them off. They are all shown in the book here, and the cures that I used are exactly the same as what are shown in the book.

X112. Q. You mean the cures that you used in stating your conclusions?

A. And also the cures that I used in the reproduction of these formulas.

X113. Q. I did not ask you about reproductions.

A. No, I did not state the cures Do you want me to?

X114. Q. Not if they appear there. I am asking you if you considered the cures?

A. Yes, indeed, I did consider them.

X115. Q. And the various times and temperatures, in giving your conclusions?

A. Certainly.

X116. Q. Did you mean to be understood as testifying that those tests you considered show that triphenylguanidine is better than diphenylguanidine as to activity and increase in tensile strength and other physical qualities of the rubber as given in these tests?

A. Yes. I believe that as far as these tests go, they do show that. I do not, however, wish to be misunderstood. A man might, by conducting more tests following these, varying the time of cure and other factors, have found out that diphenylguanidine was in fact a better accelerator for this stock than triphenylguanidine, but it does not appear here.

X117. Q. In your direct testimony did you give consideration to stretch and set, in forming your conclusions?

A. No, I did not mention those factors, because as I went over them, the differences were small and within experimental error, and they did not prove anything, and I therefore drew my conclusions largely from the tensile, and in order to make my point more clear, I did not encumber my statement with a number of figures that had little or no bearing.

X118. Q. What you have said is tensile are the notations in the column opposite "Strength"?

A. Yes. When I say "tensile" I mean tensile strength; those words are synonymous.

X119. Q. That you took to be the tensile strength at which it breaks?

A. Obviously that is what it means here.

X120. Q. In giving your direct testimony, did you consider the test on shoddies H-2005, lefthand page, column H?

A. Yes, I did; I compared that with X-2006, column H.

X121. Q. Did you re-test both of those?

A. No, I did not, although I tested practically the same thing—

By Mr. Wooster:

I object to that.

By the Court:

Just answer the question. If it is necessary, counsel on the other side can bring that out. But answer the question.

X122. Q. Which one did you not test yourself?

A. I tested 2006, column H, and then tested X-2005, column H, excepting that I used 18 of barytes instead of 20.

X123. Q. But the direction here is to use 20 of barytes.

A. At the time I made the test I had not seen this column here. My whole point was to test this X-2006-H, with and without diphenylguanidine.

X124. Q. But you must have made some other change, because X-2005-H and X-2006-H both add up to 100.

A. I think you will find that one of my formulas adds to 98.

X125. Q. But we have no formula in the X-book adding to 98, have we?

A. No.

X126. Q. Then why should you make one adding to 98?

A. Because I wanted to find out what effect, if any, diphenylguanidine had in X-2006, column H.

X127. Q. Several times here in your testimony you have referred to experimental error. What do you mean by that?

A. Oh, the unavoidable errors in mixing and curing and testing.

X128. Q. Difference in quality or characteristics of materials?

A. Yes; although that would not apply on any of these tests, because they were all made with the same raw materials.

X129. Q. Doesn't the milling of the rubber make a difference in the tensile strength you get from the cure?

A. Yes, indeed, it does.

X130. Q. Did you mill your rubber in these tests you made?

A. Yes.

X131. Q. Did you break it down yourself?

A. Yes, I broke it down myself, and it was previously broken down on a large mill also.

X132. Q. I mean, did you do all the breaking down?

A. I did not do the preliminary breaking down, no.

X133. Q. You got broken-down rubber into your place and then went on with it?

A. Then went on and gave it a further breaking down, which is our usual custom.

X134. Q. Where had that rubber been originally broken down?

A. It was broken down in the plant of the Lee Tire and Rubber Company, I believe.

X135. Q. Was it done under your supervision?

A. Oh, no, not at all.

X136. Q. Doesn't it make a considerable difference in the result in a test as to how that original breaking down is conducted?

A. Why, it makes a difference in the tensile strength, if there is any substantial percentage of rubber there at all. Of course, these shoddy compounds, one of them contains no rubber and the other one only contains five per cent, and the same rubber was used in all three of these check tests.

X137. Q. I mean, if you want to get a high tensile, can you not juggle the breaking down and milling of the rubber, so as to increase the tensile; and if you want to get a low tensile, can you not juggle the breaking down and milling of the rubber so as to make the tensile come out low?

A. Yes, you can get some differences that way. High tensiles usually result from not breaking down the rubber at all, and low tensile from giving it a double or excessive breaking down.

X138. Q. So isn't it fair to say that a test made by you today in the Dupont laboratories with materials such as you used, and with rubber milled by the Lee Company, is not strictly comparable with tests such as are reported by Mr. Weiss in that X-book,

made years ago, under different conditions and with different materials?

A. You are right. Of course, all of these tests were made with the same rubber, and as a matter of fact, the results which I got in duplicating his formulas gave almost exactly the same tensile. It had not before come to my attention that 2005, column H, was almost exactly the same formula as my Ed 1-A, and now that I notice it, I find a difference of less than 50 pounds in the tensile strength, which is a remarkably good check; in other words, I am led to believe that from that and the way those other results check, the conditions of my test must have been very close to the conditions of his.

X139. Q. In your direct testimony where you were comparing D. P. G. and T. P. G. you inserted a proviso in one answer, where these substances were to be used in what you said "equivalent amounts." Will you explain what you mean by "equivalent amounts"?

A. Yes. I used "equivalent amounts" in the sense of amounts which will produce the same degree of acceleration. In other words, equivalent amounts were what Dr. Kratz gave us in his paper.

Mr. Wooster:

I object to that, as volunteered and irresponsive.

By the Witness:

That is the best answer I can make.

By the Court:

You asked for an explanation, and he explains it in his own way. Whether that is sufficient or not is another question. As a matter of fact, I thought he explained it very well—at least I thought I understood it, when he passed over it.

X140. Q. You mean "equivalent amounts" amounts that would obtain the same tensile strength in a given sample of rubber—given compound of rubber?

A. Amounts which would obtain or produce the same rate of cure. As a matter of fact, when you do use amounts which produce the same rate of cure as between those two accelerators, there is substantially no difference in the tensile strength. The equivalent amounts as defined from the rate of time of cure, not by reference to the tensile strength.

X141. Q. Then would another way be to state it, that you use such amounts that in the same time, on the same compound, and with the same temperature, you get the same tensile strength?

A. No, that wouldn't be an exact statement, because, you see, the selection of equivalent amounts is based wholly upon an attempt to make these two compounds, one containing one accelerator and the other the other, cure in the same time. Now, if they happen to have the same tensile strength after you accomplish that result, that is incidental, it is not primary.

X142. Q. Then do you mean by "equivalent amounts" the amounts which make the same compound cure in the same time?

A. At the same temperature, yes.

X143. Q. Now, how do you determine the cure?

A. The cure is determined in practice by a large number of tests, which are quite technical, and I don't know whether you want me to go into them here. The shape of the stress-strain curve, the shape and position of the tensile curve, and the resistance to tear, such matters as that are what determine the period of cure; and sometimes the combined sulphur is also used, and the modulus of low elongations.

X144. Q. Well, is that the best answer you can give as to what you mean by "same cure"?

A. Yes, that is. As a matter of fact, you won't find any two rubber chemists who agree exactly as to what are equivalent cures; in other words, I might say that this compound cures in 38 minutes, another fellow come along here and say he thinks this compound is best when it is cured for 42 minutes, and I don't know who is right,—because we have so many criteria, and so many standards of judgment. But they all run pretty close together. Within reasonable limits, we all agree on equivalent cures.

X145. Q. Now, as I understand you, you take a given compound and cure it with, say, three-fourths of one per cent of diphenylguanidine for what you call the optimum cure, and you get a certain tensile, and aging qualities, and set, and stretch, and strength at a fraction of the total elongation, and all that. Now, is it your opinion that by taking a different quantity of triphenylguanidine, with a different time of cure, you can get exactly the same result?

A. No, I wouldn't say that you would get the same result in each of those particulars. For instance,

the triphenylguanidine, when it is correctly cured, will have a higher elongation. That is just a characteristic of triphenylguanidine.

CLIFFORD W. SANDERSON, a witness produced on behalf of defendant, having been duly sworn, testified as follows:

DIRECT EXAMINATION

By Mr. Edmonds:

1. Q. Mr. Sanderson, will you state your residence and occupation?

A. Long Meadow, Mass.; chief chemist of the Fisk Rubber Company.

2. Q. And you have held that position how long?

A. Since 1916.

3. Q. And prior to that, what was your occupation?

A. I went there directly from college.

4. Q. You took a technical course and got your degree at college?

A. Regular course in chemistry, with a degree of bachelor of science.

5. Q. Please look at Tables 1 and 2 of Exhibit "E", Kratz paper, and state whether or not they express the relative accelerating value of the substances named, and if so, how those values are expressed.

A. They do express the relative activity of the accelerators given in the table, and this relative activity is expressed in the amount of accelerator required in a given formula to effect vulcanization to an equivalent extent.

6. Q. By the way, did you attend the meeting where this paper was read?

A. I did.

7. Q. You heard Kratz read the paper?

A. I did.

8. Q. May relatively accelerating values be expressed otherwise, and if so, how?

A. Yes. There are several ways by which relative activity of accelerators may be expressed. Kratz used one way, namely, showing the different amounts of accelerator necessary to effect an equivalent cure. The other common way is to take the same amount of accelerator and show the difference in time necessary. Another way to show the relative activity of two accelerators would be to say that one will cure at a lower temperature; and the third, or fourth way would be to say that one would require less sulphur. The last two are not as common, and not as good methods, because there are other complications there.

9. Q. Then will you state in what ways the superior accelerating value of an accelerator may be utilized?

A. The greater accelerating value of an accelerator may be used either to cut down the time, if the same amount is used, or, providing the price is about the same, to save money by using less and curing for the same length of time.

10. Q. Is it common in commercial practice to avail oneself of the superior accelerating value of accelerators to cut down the amount used?

A. In commercial practice it is done both ways. There are other limiting factors there. For example, in curing an ordinary article, particularly a thick

article, there is a limit to the amount you can cut down the time; and if you cut down the time as much as possible, you cut down the accelerator. The cost factor enters in there, because in some operations it would be more economical to save time than it would be to save the accelerator.

11. Q. If, instead of using a less amount of a superior accelerator, its greater activity were utilized to permit of the reducing of the time, or the temperature, or both, of the cure, what result would be achieved?

A. If the activity of the accelerator is used to cut down the time, you will get a better product. That is ordinarily considered to be due to this fact: It is quite commonly accepted that vulcanization consists of two different things going on at the same time, the rubber is being broken down or depolymerized, and is being built up or polymerized by the accelerating action, and the net result is what we know as the vulcanized product.

12. Q. Has this bettering of the product through the use of accelerators been known and recognized by workers in the rubber art for some time?

A. Yes, it has been known and recognized, and developed, practically since the beginning of the use of organic accelerators. This is shown clear back in the Hoffman and Gottlob patent, No. 1,126,469, in which they said: "We have now discovered that the vulcanization of rubber generally, either natural or synthetic, can be materially promoted by the use of a methylene base, and particularly by the use of a piperidine base," etc. "and that by the use of such a base the vulcanization process proceeds more

smoothly and more quickly, while an improved product is obtained."

This principle is also brought out by Peachey in an article in the "India Rubber Journal" for October 28, 1916, in which he says: "It appears also that goods vulcanized in the presence of the new accelerator show a somewhat greater tensile strength than those cured in the normal time. Investigations on this point have not yet been completed, but a probable explanation is that the greatly reduced time of heating in which to bring about perfect vulcanization leads to a diminished amount of depolymerization, and this results in an increase in the nerve or strength of the rubber."

King, in "Metallurgical and Chemical Engineering", September 1, 1916, also points out the beneficial effect of accelerators, and the same thing is brought out very clearly in an article by Twiss and Brazier in the "Journal of the Society of Chemical Industry" for May 15, 1920, in which they say: "Most of them" that is, referring to accelerators—"but not all, by reducing the time of heating necessary cause a production of a rubber with a higher tensile strength than would be obtained by more tardy vulcanization at the same temperature, without the catalyzer, and in this direction reduction of the time of vulcanization by using an increased percentage of sulphur can have a similar effect."

These bring out the beneficial effects from the reduction of the time of cure. Now, with a given compound, within reasonable limits, and comparing accelerators of two different degrees of activity, it is possible to get the same benefit by using more of the

weaker accelerator in order to bring the time of cure down equivalent to the smaller amount of the more active accelerator. In other words, the beneficial properties are due, at least very largely, to the reduction of the time in cure made possible by the use of the accelerator.

By Mr. Edmonds:

I offer in evidence the documents just referred to by the witness, namely: "Hoffman patent No. 1,126,469, as Defendant's Exhibit "OO".

Also, a copy of an article on "Vulcanization Accelerators", by S. J. Peachey, published in the "India Rubber Journal" for October 28, 1916, as Exhibit "PP".

Also, a copy of an article entitled "Rubber Vulcanization Accelerators", by Andrew H. King, published September 1, 1916, as Defendant's Exhibit "QQ".

Also, an article on the "Acceleration of Vulcanization", by Twiss and Brazier, in the "Journal of the Society of Chemical Industry", May 15, 1920, as Defendant's Exhibit "RR".

With reference to these publications, the publication and the distribution of them, as of the dates named, is conceded.

13. Q. Now, will you look at the Weiss patent in suit, particularly the sentence beginning at line 66 and ending at line 70, on the first page? As the statement is there made, I gather you consider it incorrect, and to state the proposition fully it should say something about the amounts of the accelerators used. Is that correct?

A. Yes. That is the way it would ordinarily be taken by anyone familiar with the way of expressing the relative activity of accelerators. It would naturally be taken at the same amounts.

14. Q. This patent suggests that with D. P. G. a better product can be produced than with T. P. G. Do you agree to that?

A. No, not without explanation of the amount used. As I explained there, by the proper amounts, and using T. P. G. under the proper conditions, you can get what you can with D. P. G.

15. Q. Well, is there any suggestion in this patent of what are the proper conditions for the use of D. P. G. whereby you can get a superior product?

A. No.

16. Q. For instance, take this formula given in the patent,—is that a formula that approximates present day commercial practice?

A. No. The sulphur is too high in there, and the amount of diphenylguanidine is higher than would be considered good practice.

17. Q. The patent seems to make some point of the production of rubber which is free from bloom. Would that formula given in the patent produce a rubber that is free from bloom?

A. It would not, if cured to the proper state.

18. Q. If you tried to make a non-blooming stock by that formula, under those directions, what would happen?

A. It would be very much overcured and would perish in the laboratory.

19. Q. The patent suggests that with diphenylguanidine a product which is better with respect to

aging qualities can be produced. Do you agree with that?

A. You can get just as good aging rubber with triphenylguanidine as you can with diphenylguanidine.

20. Q. Please note the statement in the patent about hard rubber, beginning in line 55 on the first page and running over to line 61. What is the nature of that?

A. I wouldn't say that you could get any better rubber with diphenylguanidine than you could with triphenylguanidine.

21. Q. No better hard rubber?

A. No better hard rubber.

22. Q. Will you state what the fact is with reference to the flat curing curve—or the flatness of the curing curve, with diphenylguanidine and with triphenylguanidine?

A. That, again, all depends upon the conditions of use. In the formula of the patent, you would not get a very flat curing curve with diphenylguanidine, in fact, you would probably get a better or flatter curve with T. P. G., under the conditions conforming to the patent.

23. Q. Well, are there other conditions not pointed out in the patent whereby you might secure a flatter curing curve than with these conditions that are named?

A. I am not positive about that. That would depend somewhat upon how high a temperature you used. I would say that at fairly low temperatures you could get a flatter curve with T. P. G. than with D. P. G.

24. Q. How does the practice put forward in this patent in suit, in the formula that is stated there, compare with the commercial practice, in the use of hexamethylenetetramine and triphenylguanidine?

A. The amount of accelerator is more nearly right for T. P. G. than hexa.; the amount of sulphur is somewhere near commercial practice for T. P. G. and too high for hexa.

25. Q. Have you made a comparison of results that would be obtained, following the formula of the patent in suit, and using D. P. G. as suggested there, and a similar mix wherein T. P. G. is employed?

A. I have.

26. Q. Will you state with what result?

By Mr. Kennedy:

Anticipating that this may refer to tests made for the purpose of the suit, I renew my objection previously stated. And I assume that objection may run, without repetition.

By the Court:

Let the record show the objection, and that it may be a running objection.

A. I have taken here and duplicated the formula of the patent namely: Rubber 50; zinc oxide 45½; sulphur 3½; D. P. G. 1, and I have cured that over a range of cures from 10 minutes to 50 minutes at 40 pounds, and gotten the tensile strength and elongation. And I have also taken a formula which is exactly the same, except that for one part of D. P. G. I substituted eight part of T. P. G., which is just about the ratio shown by Kratz, and similarly, I have

cured it over the same range of cure, and made the same test. These results show that the maximum tensile obtainable with D. P. G. and with T. P. G. differ only by one point—that is just an accidental difference, because the method is certainly not accurate, anywhere near that extent. In other words, I obtained the same tensile with the T. P. G. formula as with the D. P. G. The tests bore out what I said before, because the rate of cure, as shown by the test results over a range was about the same. As far as flatness of cure goes, the D. P. G. results start at 2390 and go up to 3480, and after 50 minutes had dropped down again to 2460, while the T. P. G. starts 2245, or practically the same, and goes up to a maximum 3479, or practically the same as the maximum of the D. P. G., but at the end of 50 minutes is still up to 3350 pounds.

The elongations for the corresponding loads are slightly greater for the T. P. G. sets than for the D. P. G.

By Mr. Edmonds:

This sheet regarding the witness's test is offered in evidence as Defendant's Exhibit "SS."

By the Witness:

I also have the slabs of rubber cured over the same range, which show that, if anything, the T. P. G. set feels a little snappier than the D. P. G.

By Mr. Edmonds:

I will offer in evidence this set of rubber slabs just produced by the witness as Defendant's Exhibit "TT."

27. Q. Is there any further explanation of what these slabs represent?

A. They represent exactly what is shown on the sheet; in other words, the two formulas, as represented, cured over the same range of cure.

28. Q. Isn't it a fact there are two groups of slabs here, each group representing a series of tests wherein some one factor varied progressively?

A. We have two sets, the same as we have two formulas.

29. Q. Will you look at the Weiss patent, particularly the sentence on page 2, beginning at line 15, and state what your views are on that point?

A. Why, that is practically meaningless, because that had been done years before. It was even done before organic accelerators had been discovered. For example, in a tire it is necessary to have parts that are harder and less elastic.

30. Q. Is that a common practice with hexa. and other accelerators?

A. Yes; it is. I say it was done even before organic accelerators were discovered.

31. Q. And with those accelerators, was it accomplished in the same way?

A. Yes.

CROSS-EXAMINATION.

By Mr. Wooster:

X32. Q. On this Exhibit "SS," who is E. W. Fuller, whose name is signed there?

A. The man who actually did the work.

X33. Q. You did not do the work yourself?

A. I did not do the actual testing myself.

X34. Q. These are figures given to you by him?

A. That is right.

X35. Q. Where were you when he was doing the work?

A. I was present part of the time; part of the time I wasn't. It was done under my direction, but I wasn't present at all times.

X36. Q. Which of these readings given here did you see taken?

A. I can't identify them.

X37. Q. Did you do the weighing?

A. No, sir.

X38. Q. Did you do the timing?

A. No, sir.

X39. Q. Read the steam gauge for the temperature?

A. No, sir.

X40. Q. Look at the machine that gave the tensiles and elongation?

A. I watched it—I was present and watched it.

X41. Q. What was it—a Scott machine?

A. No; an Olsen.

X42. Q. Do you take readings off that machine, or does it draw a curve?

A. It draws a curve.

X43. Q. Then you translate the curve?

A. Mr. Fuller did that.

X44. Q. Mr. Fuller translated the curves? What became of the test pieces, that went into the machine?

A. I can't say whether Mr. Fuller save those or not.

By Mr. Wooster:

In view of the answers of this witness, I move to strike out the testimony and this exhibit, as secondary and not proven.

By Mr. Edmonds:

If your Honor please, Mr. Fuller is present, and will be placed on the stand next. It had not occurred to me that any such objection as this would be offered, or I certainly would have put Mr. Fuller on the stand first.

By the Court:

Very well. We will overrule the objection and note you an exception, in view of the offer of further proof.

X45. Q. I understood you to say that the formula of the patent in suit would be very much overcured. Did you mean with the cure given in the patent, or if you continued the cure with that high percentage of D P. G.?

A. The question was: if you cured that formula to a non-blooming state, and I answered that it would be overcured.

X46. Q. What was the time required to bring it to the non-blooming stated—and temperature?

A. Why, I think it would take about two hours.

X47. Q. What temperature?

A. At 40 pounds.

X48. Q. Wasn't this the result that you thus obtained?

A. Not on that actual formula. I was simply speaking from experience.

X49. Q. Oh, you were speaking from your general experience, not from any specific tests, when you said that that formula of the patent would be very much overcured, if you cured it until there wasn't any bloom?

A. I know that for a fact, that you can't cure rubber with a large per cent. of sulphur on the rubber to a non-blooming state and not have it overcured.

X50. Q. Well, at the time rubber is non-blooming practically all the sulphur is combined, is it not, or do you have non-blooming stocks with considable percentage of free sulphur?

A. It depends upon the amount of rubber present in the compound. If it is nearly a pure gum compound, you can have 75/100 of a per cent. of sulphur left and still have it non-blooming. With that amount of rubber there, there would have to be less than half a per cent. of free sulphur, I would say.

X51. Q. In order to have it not to bloom. Did you write any report to your company on what you heard at that Philadelphia meeting in 1919?

A. I was in the habit of taking notes. Whether or not I did take notes or not there, I can't say.

X52. Q. You haven't the notes now, have you?

A. No, sir.

X53. Q. Would you say you did not make any formal report to your company of what happened at that meeting?

A. I can say that I made no formal report to the company; yes.

X54. Q. Does your company use diphenylguanidine in its standard formulas?

A. Not at the present time.—I won't be certain of that. We may use some small amount in some compound. It is not one of our large accelerators.

X55. Q. Your company principally uses methyleneparatoluidine?

A. We have in the past.

X56. Q. And you have a patent covering that, have you not?

A. Yes.

X57. Q. Do you use more T. P. G. than you do D. P. G., or vice versa?

A. We are not using any T. P. G.

X58. Q. And you use some D. P. G.?

A. Whether or not, right at the present time, we are using it, I can't say. We have never used D. P. G. very extensively.

EDWARD W. FULLER, a witness produced on behalf of defendant, having been duly sworn, testified as follows:

DIRECT EXAMINATION.

By Mr. Edmonds:

1. Q. Where do you reside, please?

A. Springfield, Mass.

2 Q. And with what company are you connected?

A. Fisk Rubber Company.

3. Q. In what capacity?

A. Research chemist.

4. Q. You have been doing that right along?

A. Four years.

5. Q. I show you Defendant's Exhibit "SS," which Mr. Sanderson just testified to. State what you know about that, and what, if anything, you did?

A. I conducted this test from the weighing out of the raw material to the testing of the cured rubber.

6. Q. At the request of Mr. Sanderson?

A. At the request of Mr. Sanderson.

7. Q. Under his more or less direct supervision?

A. Yes, sir.

8. Q. And with his approval?

A. Yes, sir.

CROSS-EXAMINATION.

By Mr. Wooster:

X9. Q. Have you the test pieces with you from which you made up those tables?

A. No—the pieces were broken.

X10. Q. Those are the ones I mean.

A. The slabs I presented here were the same time and the same cure.

By Mr. Edmonds:

X11. Q. What are these slabs, Exhibit "TT"?

A. Consists of 100 parts of rubber, 91 parts of zinc oxide, 7 parts sulphur, 2 parts D. P. G., cured various lengths of time at 40 pounds of steam pressure.

By Mr. Wooster:

Witness reading from the top slab?

By the Witness:

Reading from the top slab; yes, sir.

X12. Q. Are these slabs the slabs that you produced in the course of the tests which gave you the information which is recorded on Exhibit "SS"?

A. Those were cured at the same time, and in the same mold, but the slabs were broken.

X13. Q. The first five of them were cured with D. P. G. and the second five with T. P. G.?

A. Yes, sir.

X14. Q. Changing the time of the cure in each instance, in each of the series of five?

A. Yes, sir.

X15. Q. That was done by you?

A. Yes, sir.

X16. Q. As I understand it, the results recorded on this sheet Exhibit "SS" were obtained from pieces of rubber that were cured in the mold at the same time that these pieces Exhibit "TT" were cured?

A. Yes, sir.

By Mr. Wooster:

X17. Q. Well, this Exhibit "SS" is a compilation of averages taken from a whole lot of pieces you tested, isn't it?

A. The resultant average of four individual pieces broken.

By Mr. Kennedy:

The objection as to *ex parte* tests applies here, your Honor.

X18. Q. Some of those pieces tested high and some low, did they not?

A. They varied slightly; yes, sir.

Adjourned until Thursday, October 15, 1925, at ten o'clock A. M.

Thursday, October 15, 1925.

MORNING SESSION.

By Mr. Edmonds:

If your Honor please, defendant's case is complete, except for two witnesses which we will have to produce because the other side wishes to examine them on points that I think are unnecessary.

SETH R. CLARK, recalled, testified as follows:

DIRECT EXAMINATION.

By Mr. Edmonds:

53. Q. During the course of your work with the Republic Rubber Company, did you become closely familiar with "C" shoddy, and with "G" shoddy?

A. I did.

54. Q. At a time quite recently, did Mr. Bridgwater try to obtain from you as to what shoddies now available most closely approximate the "C" shoddy and the "G" shoddy of the Republic Rubber Company?

A. He did.

55. Q. Did you tell him?

A. I did.

56. Q. The "C" shoddy and the "G" shoddy of the old Republic Company cannot be bought now under those names, can they?

A. They cannot. They were special reclaims made there, and they are no longer available.

57. Q. You told Mr. Bridgwater what, from

your experience, you believed to be the most closely available shoddies to those two?

A. Yes.

CROSS-EXAMINATION.

By Mr. Wooster:

X58. Q. Do you know the composition of the "C" shoddy or the "D" shoddy, as made by the Republic?

A. No one knows the exact composition of any specific lot of "C" shoddy or "D" shoddy made by the Republic.

X59. Q. Meaning that you do not know?

A. No one knows the composition. Those reclaims vary considerably from lot to lot. In minor considerations, they would not affect tests.

X60. Q. Was it part of your duty at the Republic to prepare these shoddies?

A. I was very closely associated with the preparation of them; yes, sir.

X61. Q. I asked if it was in your charge to make those shoddies?

A. I did not make the reclaims.

X62. Q. Did you determine the process by which they were made?

A. That was a patented process. I did not invent the process.

DANIEL H. POWERS, a witness called on behalf of defendant, having been duly sworn, testified as follows:

DIRECT EXAMINATION.

By Mr. Edmonds:

1. Q. Will you please state your present occupation and place of residence?

A. At the present time, I am employed by the Du Pont Company as a research chemist, and as a research chemist dealing with the preparation of synthetic organic compounds. My residence is Pennsville, New Jersey.

2. Q. From what college did you graduate?

A. I received an A. B. degree from Boston University.

3. Q. What year was that?

A. 1921.

4. Q. Thereafter, did you pursue your studies at another college?

A. At Princeton University.

5. Q. For what period and leading to what degree?

A. In 1923 I received a Master's degree from Princeton University, and in 1924, I received a Doctor's degree from Princeton University.

6. Q. Did you do some special work in the preparation for your Doctor's degree, and if so, state what it was?

A. In the preparation to obtain my Doctor's degree, there was first of all the general examination, of course, which implied a general knowledge of chem-

istry. The special work was devoted to the preparation of some fifty new, undescribed compounds, in connection with my thesis work on a series of new compounds.

7. Q. Have you recently, at the request of Mr. Bridgwater, prepared certain organic compounds, or rather, the particular six organic compounds whose names appear on this Exhibit "HH," which I now hand you?

By Mr. Kennedy:

I assume our objection as to *ex parte* testimony shall run without repetition.

By the Court:

Yes.

A. I have.

By Mr. Edmonds:

8. Q. Was the preparation of those substances conducted with such care and such attention to detail, and in such accordance with the most approved chemical methods, that, as a result, you are able to say that the substances which you prepared are in fact the six substances whose names appear here?

A. Yes, I am.

CROSS-EXAMINATION.

By Mr. Wooster:

X9. Q. Did you analyze the raw materials you used before starting the preparation of these substances?

A. I analyzed them in every case where it was at all necessary.

X10. Q. You decided for yourself whether it was necessary, did you?

A. I feel sure that the standards that are required for that work were entirely equal to, and superior to, most analyses that are necessary for synthetic work on new hitherto undescribed chemicals.

X11. Q. But I mean, you made the decision yourself as to what purity of materials you would accept?

A. All materials that I accepted were materials whose purity are accepted wherever they are sold as accepted purity.

X12. Q. That may be so, but what I asked is: you yourself made the decision as to whether you would accept the purity of the material as you got it or test it?

A. Who shall be definitely qualified to make that opinion better than myself?

X13. Q. It is not a matter of qualification. I am asking if that is what you did. You made the decision, did you not?

A. Would you state just exactly what you mean?

X14. Q. You decided whether or not to accept the material which was handed to you, or to test it for purity?

A. Yes, on the strength of where I received the materials.

X15. Q. Did you find any of these reactions mentioned in the books?

A. Three of them.

X16. Q. And the others you worked out for yourself?

A. I did.

X17. Q. After you got the materials you were after, what tests did you subject them to?

A. I subjected them to a series of tests that would check their purity, in most cases, by four distinct methods, and I think in other cases, by at least three different methods.

X18. Q. Will you give those methods?

A. First of all, where the melting points of the compounds were known, I took that. That is usually accepted as a satisfactory criterion alone. Then I analyzed it for at least one of its constituents; that is, one of the elements that was present, and then its physical properties, such as appearance, and finally as to its solubility.

X19. Q. Is that all you did?

A. Beside that, the method of preparation in itself is a sufficient indication and a very strong consummation of construction.

X20. Q. Did you make any nitrogen determinations?

A. Where they were necessary.

X21. Q. You decided that?

A. I decided that with discretion.

X22. Q. Did you take any molecular weights?

A. I don't believe it was necessary.

X23. Q. Meaning, you did not take any molecular weights?

A. I did not.

X24. Q. Did you make any carbon or oxygen or hydrogen determinations?

A. I did not, and I feel it would be absurd to make such.

X25. Q. If you did not obtain molecular weights,

how could you be certain that you had a substance of simple formula or a polymer of greater molecular weight, but having the same percentage compositions of carbon, nitrogen, oxygen and hydrogen?

A. Its melting point would check if you would accept the work of a previous author in the literature, as a chemist does usually. That would check that it was not a polymer.

X26. Q. What did you do when you did not have the substance mentioned?

A. I studied its properties as to solubility, which in many cases vary widely when there is a change of polymer modification.

X27. Q. Is it not a fact some urea compounds are very close in melting point to guanidine compounds of quite a different nature?

A. Not along the line I was studying here.

X28. Q. Do you yourself accept melting point alone as an accurate indication of whether or not you actually have the substance which you started out to get?

A. Not alone.

X29. Q. Are you not liable to be mistaken as to melting point, if you go by the literature?

A. Not within the limits of experimental error.

X30. Q. Did you ever see any references in the literature to the melting of monophenylguanidine?

A. I have not.

X31. Q. If you saw one reference saying that monophenylguanidine has a melting point of 193, and another reference, saying that the same substance has a melting point of 60, which do you accept? The one that you consider the most authoritative?

By Mr. Edmonds:

I object, because it is irrelevant.

By the Court:

It is testing the knowledge of an expert witness.

(Question read.)

By the Court:

Your objection is to the general line of examination rather than to the form of the question, I take it?

By Mr. Edmonds:

Yes, sir. And it has no purpose except to save time.

By the Court:

I will overrule the question as put.

By Mr. Wooster:

What I want to see is whether this witness accepts what he reads in literature as the melting point, and what he takes when he sees two different melting points for the same substance.

A. In a case like that, first of all the authority of the man writing it would bear weight, but in a case of that sort it is probable that neither melting point would be accepted until independent work of my own, or some one else published, would tend to confirm it.

By Mr. Wooster:

X32. Q. If you see a substantial difference in the melting point given in the literature in different

references for the same subject, is it not likely that one or the other did not have what he thought he had?

A. Not necessarily. He may have an impure form of the same compound.

X33. Q. On this dibenzoylguanidine, referred to in this Exhibit "NN," what determinations of that did you make?

A. In preparing that compound, first of all the method of preparation, according to the well-known Schotte-Baumen syntheses, would lead one to the conclusion that this compound should be formed; second, the melting point as described in the literature was checked by the product that I obtained; third, its analysis in nitrogen checked the product which I obtained; fourth, its solubility in a series of five organic solvents checked the purity of the compound; fifth, the method of reaction as described in the literature was observed to be followed in this particular reaction.

X34. Q. Rather than saying that these determinations checked, will you give the figures that you obtained?

A. I don't remember them.

X35. Q. Have you got them with you?

A. I have not. I can tell the melting point.

X36. Q. Please do.

A. 265 degrees Centigrade.

X37. Q. Sharp melting point?

A. The compound I prepared was sharp melting point.

X38. Q. How much did you prepare altogether?

A. Approximately 30 to 40 grams.

X39. Q. What kind of a looking material was it?

A. Pure white.

X40. Q. Like sugar or salt or cotton, or what?

A. As it forms in an aqua salt, it has a flocculent white precipitate. The flocculent is cheesy, which is characteristic of this type of compound.

X41. Q. You simply dried it or washed it?

A. I washed it with hot petroleum ether.

X42. Q. What was your figure on nitrogen determination?

A. I haven't that here. It satisfied me as to checking this compound within the limits of experimental error.

X43. Q. How can you differentiate this compound from urea, which has a closely similar melting point?

A. By its nitrogen analysis.

X44. Q. Have you got any of the material which you prepared?

A. I gave a sample of it to Mr. Bridgwater.

X45. Q. Why did you not bring your records of this work and the figures you actually obtained?

A. As to analyses or melting points?

X46. Q. Everything you got?

A. I brought along all my records as to the method of preparation, and that was all I felt was necessary. I can send for the nitrogen analysis or have another one made.

X47. Q. Have you an extra sample of this material which you can give to the plaintiff for that and other determinations?

A. I have not; but I would be glad to make a sample by identical methods and give it to the plaintiff.

By Mr. Wooster:

I move to strike out this deposition as incompetent, because the witness has not brought the facts which he actually determined, but has stated his conclusions, and while he is obviously testifying in good faith, he is not bringing in here the facts with scientific accuracy that an inquiry of this nature demands.

By the Court:

The objection is overruled and an exception noted.

By Mr. Edmonds:

Defendant offers in evidence a copy of the Weiss patent 1,422,506, this being the patent that has been referred to from time to time as covering the process of making D. P. G. devised by Mr. Weiss, being Exhibit "QQ."

Defendant also offers in evidence all of the depositions taken in the National Aniline suit, that are referred to in the stipulation in this case heretofore offered in evidence. As a matter of convenience, we have agreed to use a printed volume of the record in the old case as prepared, and I suppose that volume can be marked as an exhibit as a whole, instead of each of the several depositions. In that volume is certain correspondence between Dr. Kratz and the Dovan Company, and I wish to offer that in evidence. I suppose my adversaries will agree that the copy in here is an authentic copy of the correspondence that took place. It is on pages 498, 499, 500 and 501.

By Mr. Wooster:

I object to the offer of this correspondence. The witnesses are here, and it seems to me that they should be called to testify here. There is no stipulation made that these matters from the other record could be so offered, and I do not think it is the way to do it.

By Mr. Edmonds:

That is perfectly true. If you do not agree to accept these, I will have to withdraw my offer. The originals are here, but it is somewhat more convenient to use the copies of the record.

By the Court:

Is the subject matter relevant, first of all?

By Mr. Edmonds:

I think it is relevant, because it reflects the position of Dr. Kratz. Immediately after this Weiss patent was issued, he wrote them and asked them what they meant by taking out a patent on something he had disclosed some four years before. They wrote him a letter, in which they said they would be glad to hear from him. Then they had some one write him, saying that the first letter was written for legal reasons.

By the Court:

Is there any admission on the part of the plaintiff in connection with that? I can hardly see, if there is not something of that nature in it, that the correspondence would be evidence.

By Mr. Edmonds:

If Mr. Wooster will not accept the letters, our discussion is beside the question, and I will withdraw the offer.

By Mr. Wooster:

I object, on the ground that they are wholly incompetent and immaterial. They relate to things that happened shortly after the patent was issued, and are not involved in this case at all.

By Mr. Edmonds:

I offer in evidence a sheet of chemical formulas of the substances that we have referred to, solely because I think it may help to enlighten this subject. If my adversary thinks any part of that is not entirely correct, I will allow him to change it, or withdraw the exhibit.

(Sheet marked Exhibit "QQ"—1.)

I offer in evidence a copy of the original affidavit of Mr. Daniels, in connection with one of the motions in the National Aniline case. This is the copy that was shown to Mr. Daniels when he was on the stand, and he stated it was his affidavit and he was questioned about it. I find, through oversight, it was not offered at that time.

(Exhibit "UU".)

I have here a copy of Richter's Chemistry, that was used by the Republic Rubber Company, and this is the book that Weiss and Carlton said they looked at when the conception of this invention is alleged to have taken place. I think it would be helpful, and I wish to have in the record, a copy of one page, and I now offer that.

I assume there is no objection to that. I will have copied page 88 in Richter's Organic Chemistry, the bottom portion of this page, beginning with "Phenylated Guanidine Derivatives":

"Phenylated Guanidine Derivatives (see vol. I, Guanidines).

Diphenyl-guanidine, $H\,N{:}C{<}^{NH.C_6H_5}_{NH.C_6H_5}$ (melaniline), melting at 147°, is produced by the action of cyanogen, chloride upon dry aniline, and by digesting cyananilid (p. 90) with aniline hydrochloride. It is, like guanidine, a mono-acid base. Carbon disulphide transforms it into sulpho-carbanilide and sulphocyanic acid.

a. Triphenyl-guanidine, $C_6H_5.\ N{:}C{<}^{NH.C_6H_5}_{NH.C_6H_5}$ melting at 143°, is obtained on heating diphenylurea or diphenyl-thiurea, alone or with reduced copper, to 140°. It is most readily prepared by digesting an alcoholic solution of diphenyl-thiurea and aniline, with litharge or mercuric oxide (or by boiling with an iodine solution). Heated with CS_2, it reverts again to diphenyl-thiurea and phenyl mustard oil.

B. Triphenyl-guanidine, $C{<}^{N(C_6H_5)_2}_{NH.C_6H_5}$, melting at 131°, is obtained by heading cyananilid with H Cl—diphenylamine. It decomposes into diphenylamine, phenyl mustard

oil, and sulphocyanic acid when heated with carbon disuphide."

By Mr. Edmonds:

In one of the early days of this trial, not long ago, there were some facts in connection with this interference that Weiss is involved in, and I stated on the record such simple facts as I thought would be accepted at once, and because of that, I did not go into details about that with Mr. Weiss. I now ask Mr. Wooster if he will accept as true the statement on pages 168 and 169 of the record. It is a very simple statement of things that are quite obviously accurate. Of course, if they are not, I will be glad to change them. I want an accurate statement to connect up the brief that has already been received in evidence with the testimony that has gone in about that interference.

By the Court:

You mean the record of the present case?

By Mr. Edmonds:

The record of the present case. There has been some examination of the witnesses about this interference, and a statement of the outstanding facts seems to be necessary to connect the two together. I put that statement on the record at pages 168 and 169, with the idea that counsel would at some time tell me whether he agreed that that is correct. Now, I ask him if he will do so.

By Mr. Wooster:

I make no objection to that statement of Mr. Edmonds as he gives it, but he has abstracted proceedings in a Patent Office record involving over 200 printed pages, for Weiss, and more than that number of printed pages for two other parties. I think the records are the best evidence.

By the Court:

Offer the record.

By Mr. Edmonds:

I have offered what I want. I put no limitation whatever on how much shall go in. If Mr. Wooster wants some more, or all of the rest, he may offer that. I have not offered anything I do not want; but there is no limitation on what he can do.

By the Court:

I don't know that he is required to do that. The force of it will be affected by the testimony offered.

By Mr. Wooster:

I raised no objection. Why not put the record in, and let either party use what they want from it?

By the Court:

It is not incumbent on counsel to admit the correctness of any portion of your case.

By Mr. Edmonds:

I will offer a copy of this Weiss record, because of Mr. Wooster's attitude. I accompany

this with a statement that it is useless to me, and, so far as I know, it will be useless to the Court, and for that reason I do not like to offer it in evidence. But since the matter is put up to me in that way, I now present this as an exhibit for the defendant. I think that there ought to be on the record some explanation of what this record refers to, and there would have been such a statement brought out from the witness Weiss, had it not been for the fact that I assumed a short statement of the connection between these two proceedings would readily be agreed to, and that is all that the statement on pages 168 and 169 is. The record is marked Exhibit "VV."

By Mr. Edmonds:

I call on plaintiff to produce the document called for during the course of the testimony of Mr. Brill.

By Mr. Wooster:

Plaintiff produces its copy of the contract referred to between itself, Perth Amboy Chemical Works and Graselli Chemical Company, and respectfully submits to the Court that that contract is privileged here, and should not be shown to Mr. Edmonds or any of his associates here. Certainly it is privileged as to the defendant, Corona Cord Tire Company, which up to now is the only party of record for the defendant. This three-party contract relates to a license agreement under a patent owned by the Graselli Company, No. 1,149,580, which is now in suit in the Southern District of New York, against National

Aniline & Chemical Company, which is represented by Mr. Edmonds and his firm. This inquiry for this contract here in this case appears to me to be merely a fishing excursion to discover something of possible use in the Graselli-National case than for any issue here. I submit the document to the Court, but I object to Mr. Edmonds seeing it.

The agreement I object to producing is a three-party agreement involving the Graselli Company under another patent. I here produce an agreement dated October 7, 1924, between the Perth Amboy Chemical Company and the Dovan Chemical Corporation, respecting the two Weiss patents that have been mentioned here, the one in suit and the other on the process of the patent just offered as defendant's exhibit.

By Mr. Edmonds:

That is still another paper. We were told that three papers evidenced the whole agreement. Evidently there is something else. This is the third paper that was said to evidence the remaining elements of this agreement that we wish to see. Among other things, I want to know whether this suit is being conducted because there is some provision that royalty is payable to somebody while they are still suing. If that is the reason this suit is brought and is prosecuted I would like to know it.

By Mr. Wooster:

I will say that royalty is not paid by anybody until this patent is held valid and infringed.

By Mr. Edmonds:

That is typical of the reason I must see these documents.

By the Court:

So far as I understand the relevancy of this particular matter, I do not think the other is essential, and I will hold that counsel is not required to produce this other agreement. As I get it, this third agreement is perhaps a change simply of the terms of payment, but is in no sense an abrogation of the license.

By Mr. Edmonds:

I can't reply directly to your Honor, because I don't know what is in that document; but among other things that are in it, is what the witness stated here, that in that document this Perth Amboy Chemical Company agreed to allow the Graselli Company to do something which it had no right to do, namely, to grant a license under some other patent to this plaintiff here.

By the Court:

After examining that agreement and considering it, I shall not require the production of that agreement. The plain matter is to show the license to the Perth Amboy Company, and the agreement produced for the inspection of the Court, in connection with the other contracts which were offered in evidence, is not one which affects the license to the first Perth Amboy Company. That is, it seems to me that while it may be collateral to a certain extent, it is not relevant upon the question here as to whether or

not the Perth Amboy Company did pay a license to the plaintiff company here. With so finding, I will rule that the plaintiff is not required to produce the contract, and will note an exception to defendant.

DEFENDANT RESTS.

GEORGE D. KRATZ, recalled on behalf of defendant in sur rebuttal, out of order, by agreement of counsel, testified as follows:

DIRECT EXAMINATION.

By Mr. Edmonds:

395. Q. Doctor, is there any part of your testimony, as you gave it here on Monday or Tuesday, that you would change in any way, by reason of anything said by the two witnesses, Shaw and Hoffman, who have been produced here by the plaintiff?

A. No; there is not.

CROSS-EXAMINATION.

By Mr. Wooster:

X396. Q. Did the witnesses state it right, that the period of mixing was about forty-five minutes for each batch?

A. Thirty-five to forty-five minutes is right.

X397. Q. And were they right that each batch was about 100 pounds?

A. That is right; yes, sir.

X398. Q. And is Mr. Shaw right as to the T-8 formula being written in pounds and ounces as he got it from you?

By the Court:

Mr. Wooster, I don't know where we are going to end on this thing, if every time a witness is called to the stand he is called to repeat a lot of testimony. Now, of course, it will be accepted as right unless it is contradicted by other testimony. If they have not contradicted it, why take up the time?

By Mr. Wooster:

Well, he is in fact contradicting it by one blanket question.

By the Court:

No, he does not. I don't see why he was called at all. And if it was merely that the time of the Court was being taken up by repeating the testimony of half a dozen witnesses, I must say that I am going to stop your cross-examination.

By Mr. Wooster:

I don't see why Mr. Kratz is put back.

By the Court:

I don't either. It certainly is for no reason that you should turn in and have him repeat a lot of testimony given by your witnesses, which is not denied. I am getting clear out of patience with the way the time has been taken up.

By Mr. Wooster:

If your Honor comes to read this testimony, you will see it is pertinent.

By the Court:

Well, if it is not denied, what a witness says will be taken as the truth. And when he is called and asked a general question of that kind—which ought never to have been put to him I am free to say, and he ought never to have been called back on the stand, because he swore to all that, and unless he is called back to make some specific change, of course his testimony would stand. Now, if this is going to be an excuse for you to go ahead and get a lot of other stuff that has not been given by him, or if given, it already appears in the record, and take up the time in that useless way—This is getting quite on my nerves.

By Mr. Wooster:

Well, may I strike out my cross-examination?

By the Court:

You may leave it just as it is, and you may leave my remarks on the record just as they are; but I am telling you I don't want any more of that kind of cross-examination.

SUR-REBUTTAL.

ERNEST R. BRIDGWATER, recalled in sur rebuttal, testified as follows:

DIRECT EXAMINATION.

By Mr. Edmonds:

146. Q. Is this sample of diphenylguanidine produced by plaintiff's witness Williams a sample of the chemical article?

A. It is probably chemical in purity. I have no knowledge as to that, but the material often crystallizes in very coarse and dense crystals, and couldn't possibly be used as it is in the vulcanization of rubber.

147. Q. Is this sample that I now hand you the diphenylguanidine product, as actually used by manufacturers?

A. Yes. This is material that was precipitated in the regular rubber procedure.

148. Q. How much is in that bottle?

A. Five grams, exactly.

By Mr. Edmonds:

I offer in evidence the bottle identified by the witness as Exhibit "YY."

CROSS-EXAMINATION.

By Mr. Wooster:

X149. Q. What is the trouble with the sample offered by Mr. Williams?

A. It is a coarse, crystallized, unground product. It couldn't be used in rubber. It is not the material

he sells for use in rubber. If he were going to sell that, he would grind it.

X150. Q. Your objection to Mr. Williams' sample is that his crystallized as they were recovered, without being ground?

A. I presume that he was crystallizing under such conditions as would produce large crystals.

X151. Q. So that when you grind it the bulk increases?

A. Yes. The chemical product is always ground. Of course, you can make a wide variation in the density of the chemical product, that is, by pressing it, filter pressing it, and blowing it with air in the filter press, you can make it very dense.

X152. Q. This sample produced is one obtained within a few days and not such as might have been had in 1917, is it?

A. This is, I should say, such as might have been used in 1917. It was prepared in the laboratory some time ago.

X153. Q. Do you know what was put out in 1917, in the way of diphenylguanidine?

A. Not from my own knowledge.

DEFENDANT RESTS.

TESTIMONY CLOSED.

REBUTTAL.

By Mr. Kennedy:

At a previous session, Mr. Edmonds was asked by Mr. Wooster whether or not the Du Pont Company was paying the expenses of, and had control of, this litigation. That question Mr. Edmonds refused to answer. Thereupon we put on the stand Mr. Doty, for the purpose of showing that Mr. Doty had knowledge of the connection of the Du Pont Company with this litigation.

By the Court:

As I recollect it, I sustained an objection to the introduction of that particular proof, stating that if I had occasion to change my mind as to that I would so announce later in the case. Now, I am not certain that that is correct.

By Mr. Kennedy:

I find in the record here, "The Court: I doubt if the agency even has been established. I will for the present sustain the objection." Now, my sole purpose now is to call your Honor's attention to decisions that I didn't then have on this very point. One is by Judge Shiras, reported in 41 Fed. Rep., at 351. There the Court said:

> "In the brief filed by complainant, it is asked, in case a decree is ordered in favor of the complainant that the same in terms shall run against F. P. Mast & Company, a corporation created under the laws of Ohio.

From the evidence in the case, it appears that the defendants, ... and .....Miller, are the agents for Mast & Company in Iowa, and that the machines sold by them were manufactured by Mast & Co., and that the company, through its attorneys and agents, is in fact conducting the defense of the case. Under the rule recognized in *Lovejoy vs. Murray* (and some other cases that the Court referred to) it is clear that Mast & Co. will be as fully bound by the results of the present litigation as though the corporation was a party to the record, for it is made clear that the principal party in interest being the manufacturer of the machines sold by the defendants Miller and bound by contract with them to protect them against the consequences of infringement, it has had notice of the pendency of the suit, and in fact has assumed the control and management of the defense, and therefore, under the doctrine of the case just cited, the decree herein will be in fact binding upon the corporation. Another good reason is perceived by a statement in the decree, though it may not be made to appear upon the face of the decree, that in fact Mast & Co. is bound in the results reached in the prosecution of the litigation in which it has been actively engaged."

By the Court:

You asked me to do something more than that. Where it has not appeared in the course of

the testimony at all, you have asked us in this issue to try out another issue relative to the knowledge of that company, without that company receiving any notice of that inquiry, and then make a decree.

By Mr. Kennedy:

I don't ask for a decree. I do ask simply for this: that the fact as to the relationship of the Du Pont Company with this litigation, so far as the trial of it is concerned, should appear on the record here, so that we may urge estoppel in case we are successful against them, because, having the knowledge in the record here, we will have all that is necessary to proceed against them, and in doing so urge an estoppel. In other words, that they have had their day in court as to the validity of this patent and its infringement. All I ask for here is permission to show on the record here the connection of the Du Pont Company with this company.

Now, I was going to refer your Honor to a more recent case, that of *Dicks Press Guard Mfg. Co. vs. Bowen*, 229 Fed. Rep., page 196. In that case the dealer or user was sued, and the manufacturer appeared by its counsel, just as we believe the Du Pont Company has appeared here, and the Court said:

> "Is not this the effect of its voluntary appearance on the hearing and on the appeal?" (That is to say, that it should be noted in the record, or taken care of in the decree. I don't ask for that.) "Having

appeared and openly and avowedly assumed and conducted the defense thus far, it is bound by the order made, which is final during the pendency of the action. May not all this be evidenced by making the corporation a defendant on the record?" (I don't ask for that.) "And may not it be held to its appearance by now formally making it a party?" (I don't ask for that.) "It would seem plain that the Court ought to know what parties, either complainant or defendant, are before it and entitled to be heard, and that the record itself should show this." (That is what I ask for.) "One of the most vicious things connected with a litigation, either civil or criminal, is the operation of influences from, and the recognition of, interested persons not appearing as parties on the record. Those who are to be heard at all and recognized in bringing out and considering the merits of a controversy should be parties of record, and personal appearance by an attorney and participation in the litigation ought to be treated as equivalent to a formal written appearance in the case."

Now, I am asking for much less than the Court in that case decided they were entitled to.

By the Court:

That seems to have been a different situation than exists here.

By Mr. Kennedy:

I would ask that we be permitted to proceed with the examination of Mr. Doty.

By the Court:

Your idea would be that the Court would have to find that as a matter of fact. Certainly, if you introduce testimony like that, without any finding on the part of the Court, it would have no effect.

By Mr. Kennedy:

I will not ask for any finding of fact on that. The only thing I want to do is to have a record here of the real situation as to who is conducting the defense here. I will not ask for finding of fact.

By the Court:

There is to be no finding of fact. That is purely a work of supererogation of the Court in taking up its time, in the hearing of any such testimony. Testimony is introduced purely for the only purpose of enabling the Court to decide the issues of fact which have been raised by the pleadings in that cause. I will have to sustain the ruling, that I understand the record already shows.

By Mr. Wooster:

I offer a stipulation respecting a quotation to be used here from the application of Morris L. Weiss, filed July 2, 1921, for a process of making diphenylguanidine, together with a stipulation regarding depositions of Edward W. Vaill, to be

used here, taken from pages 361 and 362, of the National Record, and a stipulation respecting use of the National Record here. I ask this be copied into the record:

"STIPULATION

IT IS HEREBY STIPULATED AND AGREED by the parties hereto, by their respective counsel, as follows:

The application of Morris L. Weiss, Serial No. 482,143, filed July 2, 1921, entitled 'Process of Making Diphenylguanidine' as filed in the United States Patent Office on July 2, 1921 contained the following:

Diphenylguanidine is indicated by the formula $C< \begin{matrix} NH, C_6H_5 \\ = NH \\ NH, C_6H_5 \end{matrix}$

The object of my invention is the production of this substance in large or commercial quantities so that the same may be available in the chemical industries and particularly as an accelerator in the vulcanization of rubber compounds."

that the said application was officially allowed under date of December 19, 1921; that the said application was thereafter amended under date of February 17, 1922, by adding to the above quoted paragraph the following:

"as set forth in my co-pending application serial No. 514, 727, filed November 12, 1921, for Vulcanization Accelerators."

The amended paragraph appears at lines 10 to 23, inclusive, of the Weiss patent 1,422,506 granted July 11, 1922.

"IT IS FURTHER STIPULATED that as a portion of plaintiff's case herein, the deposition of Edward W. Vaill when recalled for plaintiff in the suit of this plaintiff against National Aniline & Chemical Company, Inc., as printed on pages 361, 362 of the Transcript of Record in said suit, together with the Exhibits referred to by him, may be offered and received in evidence herein and shall be given the same force and effect herein as if said Edward W. Vaill were produced, sworn, and so testified herein.

IT IS FURTHER STIPULATED SUBJECT to Correction should error appear, that a printed, uncertified copy of the Transcript of Record in *Doran vs. National Aniline & Chemical Co. Inc.* may be used with the same force and effect as a certified copy, subject to all other objections by either party being reserved.

J. S. WOOSTER,
Counsel for Plaintiff.

PENNIE, DAVIS, MARVIN, EDMONDS,
Counsel for Defendant.

Dated New York,
Oct. 5, 1925."

PAUL A. SHAW, a witness called on behalf of plaintiff, in rebuttal, having been duly sworn, testified as follows:

DIRECT EXAMINATION

By Mr. Wooster:

1. Q. Were you ever employed at the Falls Tire & Rubber Company?

A. Yes, sir.

2. Q. In what capacity and between what dates?

A. As compounder, from 1915 to 1918.

3. Q. When did you leave in 1918?

A. Around the latter part of May.

4. Q. Where did you go after leaving there?

A. To the Firestone Rubber Company.

5. Q. Was Mr. George D. Kratz employed by the Falls Rubber Company while you were there?

A. Yes, sir.

6. Q. When did he come?

A. In 1917.

7. Q. When did you first take the position of compounder?

A. In June ,1915.

8. Q. And you held it continuously until you left?

A. With the exception of about six or eight months.

9. Q. Who held it then?

A. Charles Smith was there a few months.

10. Q. From what period was he there as compounder?

A. He came around the first of the year 1917,

and left about the latter part of May or the first of June.

11. Q. How do you fix the date as to when Mr. Smith left?

A. He left about the time of the first registration for the army.

12. Q. What did he go into when he left?

A. He went to work on his father's farm for a short time.

13. Q. From and after the time Mr. Smith left, who did the compounding?

A. I did.

14. Q. Who else did the compounding?

A. No one.

15. Q. Will you state what the work of compounding consisted in?

A. It consisted of weighing out the amounts of rubber and pigments that went into the different batches.

16. Q. How did you learn how much of each to weigh?

A. We had a written formula that we went by.

17. Q. Where did that formula come from?

A. From the superintendent and Mr. Kratz.

18. Q. In what shape did it come?

A. On a card.

19. Q. Giving the ingredients and how much of each to use?

A. Yes, sir; in pounds and ounces.

20. Q. How much did these add up to?

A. 100 pounds.

21. Q. Was that the uniform practice?

A. It was on the larger mill that we had.

22. Q. What was the practice as to tube compounds?

A. They weighed the same amount.

23. Q. What is that?

A. 100 pounds.

24. Q. You call those 100 pound batches?

A. Yes, sir.

25. Q. And your work was to weigh up the ingredients in pounds and ounces to make up 100 pound batches?

A. Yes, sir.

26. Q. Then what became of those batches?

A. They were taken out to the mixing mills and mixed.

27. Q. How long did it take to mix?

A. About forty-five minutes.

28. Q. That is, a mill is a machine with heated rolls between which the batch is dumped and rolled around until it is mixed?

A. Yes, sir.

29. Q. Did you ever handle any accelerators?

A. I did.

30. Q. What ones?

A. Mannose.

31. Q. Is that the only one?

A. Yes, sir.

By Mr. Wooster:

I stated the other day that we would show the composition of mannose, but as Mr. Kratz did not desire it disclosed, the same will not be disclosed.

32. Q. Was it part of your work to weigh out the accelerator?

A. Yes, sir.

33. Q. Can you name some of the substances which you handled to go into these tube batches?

A. That was rubber and zinc and green oxide, mannose and paraffine, in some batches.

34. Q. And magnesia?

A. In some we did, yes.

35. Q. Litharge?

A. Not in tubes.

36. Q. How many kinds of tubes did you have compound formulas for in the summer and fall of 1917?

A. You mean, how many kinds of tubes we made?

37. Q. Yes.

A. We made green, red and gray.

38. Q. What was the name of the gray tube formula?

A. The number of the compound?

39. Q. Yes.

A. "T"-8.

40. Q. Will you look at this formula which I show you, and state what it is?

A. That is my copy of the original "T"-8 Compound.

41. Q. Where did you get that notation "T"-8 from?

A. That was written on the original compound.

42. Q Did you ever hear of a grey tube stock in your compounding room, known as 62 or 63 or 63 modified?

A. No, sir.

43. Q. On this formula you have "first latex,"

followed by "latex X". Then a dash, then a zero, then a "oz". What does that mean?

A. The "oz"?

44. Q. Yes, the whole thing. What is that cross?

A. The first column is pounds and the next column is ounces.

By Mr. Wooster:

I offer the "T"-8 formula in evidence as Exhibit No. 13.

45. Q. Did you ever make up that "T"-8 compound?

A. Yes, sir.

46. Q. Under whose instructions?

A. Mr. Kratz's.

47. Q. Do you recall an instance where tube stock formulas were not exactly followed?

A. No, sir, I do not.

48. Q. What was your practice in making them up?

A. To put them up just as it was written on the card.

49. Q. Did anyone ever instruct you in making up "T"-8 compound to vary any of the ingredients, and if so, which ones?

A. I can't remember of anyone telling me to leave anything out, or anything.

50. Q. Were you ever told to change any of the proportions as given here?

A. If there was any change made, there would be a new card written out.

51. Q. Would that card have the same stock number or be given another number?

A. It could be done either way.

52. Q. Were you ever instructed to change the amount of magnesia in this T-8 formula?

A. No, sir, I never changed anything myself.

53. Q. Have you any recollection of increasing or reducing the eight ounces of magnesia given in this formula?

A. No, sir.

54. Q. Do you recall any instance where Mr. Kratz instructed you to vary this formula?

A. No, sir.

55. Q. After you made up the batch of 100 pounds and it was milled, what was done with that milled batch?

A. It was put on a skid, as we called it, after it was cooled somewhat, and then it was ready for the calender.

56. Q. Was it handled as a 100 pound batch or several batches handled at once, or in less than 100 pound pieces?

A. In 100 pound batch, when it was taken off the mill, it would be taken off in three or four pieces, and this was all piled together on a skid.

57. Q. Did you ever watch the milling?

A. Yes, sir, I have.

58. Q. Did you ever see Mr. Kratz put anything into the batch on the mill?

A. No, sir.

59. Q. Were these pieces of the batch called slabs?

A. They could have been called slabs.

60. Q. After these pieces of a 100 pound batch came from the mill, you said they went to the calendar?

A. Yes, sir.

61. Q. Did they go to any machine before going to the calendar?

A. Yes, sir; they went to the mill that was called the warming up mill.

62. Q. Now, if there was any change in formula for one, two or more batches, where would that change first manifest itself?

A. In the compounding room.

63. Q. That is, what would be done?

A. I just don't understand your question.

64. Q. You said the change would appear first in the compound room. Would any record be made of the change or any indication?

A. Well, if the compound is being changed, we would probably have another card made out.

65. Q. I mean, if you were making up some batches of T-8 and other batches of T-8 with a slight change in it, would you mark the batch tubs?

A. We would have to mark them sort of a special batch, that way.

66. Q. But you might not mark the regular T-8 batches?

A. Not the ones that were put up according to the regular formula, no, sir.

67. Q. Why would that be?

A. As long as they were not special batches, there wouldn't be any reason to mark them.

68. Q. How could you tell what it was?

A. How could I tell?

69. Q. Yes.

A. I could probably tell by looking at it.

70. Q. You mean, you could tell the different compounds apart by appearance?

A. Yes, sir.

71. Q. Have you any recollection of any T-8 batch or similar batch being marked with a red tag

A. No, sir.

72. Q. Did you ever see any red tags in your compound room?

A. Not any red tags, no, sir.

73. Q. What kind of tags did you see?

A. We used a small white tag.

74. Q. What was marked on that tag?

A. Showed the number of the compound.

75. Q. Who made the mark?

A. The mill man that mixes the compound.

76. Q. How did he know what to mark on the white tag?

A. Well, he would know the different numbers that we were running at that time. If he wouldn't know himself, I would tell him.

7. Q. So if there was any difference in batches, it was the duty of the mill man to mark the tag accordingly?

A. Yes, sir.

78. Q. Do you recall the names of any who worked on the mills at that time?

A. Joe Hoffman, Albert Rominsky, Albert Schmidt.

79. Q. How long since you had anything to do with the personnel of the Falls Rubber Company?

A. Since May, 1918.

80. Q. Do you know if any of the people that you have named are still employed there?

A. I think that one of them is still there.

81. Q. In order to put a special accelerator into a batch being worked on the mill, would the person putting the special accelerator in have to wait around for forty-five minutes, while one batch was being milled, before putting the same thing in another batch, or would he put the stuff in and then come back?

A. He could put it in while they were putting in the compound in the rubber, or he could drop it in a tub, or he could wait around for forty-five minutes until they got ready for the next batch,—either one.

82. Q. But there would be a period of forty-five minutes, or thereabouts, between successive batches?

A. Yes, sir.

83. Q. Did you ever hear of a master batch?

A. Yes, we have a master batch.

84. Q. What was a master batch?

A. Mannose.

85. Q. That was a mixture of rubber and accelerator?

A. Yes, sir.

86. Q. How was the master batch used?

A. We used a certain amount of it according to the compound, whatever the weight was that Mr. Kratz wished to use.

87. Q. What was the ordinary way of introducing the accelerator into tube compounds—by a master batch or some other way?

A. Up until the time Mr. Kratz came, we didn't have a master batch.

88. Q. At about August or September of 1917, what was the way of putting the accelerator into the batch?

A. We used mannose at that time. It was mixed up into the raw rubber.

89. Q. And weighed quantities of this raw rubber or master batch put in ?

A. Yes, sir.

CROSS-EXAMINATION.

By Mr. Edmonds:

X90. Q. You have mentioned the names of three men. Are those the only ones you remember, or are they all that there were?

A. These three men we had upstairs. We had two in the basement. I can recall one man's name, McCoy, and there was a foreign name.

V91. Q. Those five men were the only mill men the whole time you were there?

A. Well, we had down in the basement several men come and go.

X92. Q. You don't remember any of their names?

A. No, sir. They were mostly foreigners.

X93. Q. How many were there?

A. Down in the basement?

X94. Q. How many of these other mill men, in addition to these five were there?

A. I would say we had two or three.

X95. Q. These five men that you have mentioned, were they there all the time that you were there, from 1915 to 1918?

A. No, sir.

X96. Q. Which ones were not?

A. Albert Schmidt was not there, and this man McCoy was not there all the time.

X97. Q. Who was in their place when they were not there?

A. Before we came to the new plant we only had two mills, and then in the new plant we had two at first and one later, and then the other mills were moved over, so there was a period of time when we didn't need five mill men.

X98. Q. How many mills did you have in the middle of 1917?

A. I would say we had five.

X99. Q. Your job was the compounding?

A. Yes, sir.

X100. Q. There were various receptacles with substances in them, and you would get a paper that said so many pounds and ounces of this, that and the other, and you would get those things out and put them together and you would weigh them?

A. Yes.

X101. Q. And then that mass that you had brought together, you would send to the mill man?

A. Yes.

X102. Q. That was your job day after day and week after week?

A. Yes, sir.

X103. Q. How many batches do you suppose you mixed each day?

A. Well, we could probably run in the neighborhood of forty batches a day.

X104. Q. That you yourself compounded?

A. Yes, sir.

X105. Q. And in the course of a week that would be around 256 batches?

A. Yes.

X106. Q. And that kept up through your whole period of employment?

A. Yes, sir.

X107. Q. Now, if we made a calculation and found that in the course of your employment you mixed up ten thousand of those batches, would you undertake to tell us what happened to every one of those ten thousand batches after they left your compounding room?

A. No, sir.

X108. Q. When you sent the tubs out of the compounding room you didn't know which mill they were going to, did you?

A. Yes.

X109. Q. You knew which mill?

A. Yes, sir.

X110. Q. And which mill man was operating that mill?

A. At that time, yes, sir.

X111. Q. And would you undertake to tell us

which mill each of these ten thousand batches went through and what man operated it?

A. I couldn't tell all those batches, no, sir.

X112. Q. At which mill did Hoffman work?

A. He worked on what you would call No. 3 —counting the compounding room No. 1, he worked on No. 3.

X113. Q. All the time you were there?

A. Practically all the time, yes, sir.

X114. Q. I understood you to say that you were out of the Falls Company employment for six or eight months.

A. No, sir.

X115. Q. Your employment was continuous from 1915 to 1918?

A. Yes, sir.

X116. Q. Was it a part of that time that you were not employed in the compounding room?

A. Yes, sir.

X117. Q. Where were you employed then?

A. I was then in Mr. Barbour's office. He was superintendent at that time for a few months.

X118. Q. You were in his office?

A. Yes, sir.

X119. Q. What work were you doing there?

A. I made various records for Mr. Barber, and also for the office.

X120. Q. And that continued for six or eight months?

A. Approximately, yes.

X121. Q. When was that?

A. It was in the early part of 1917, and possibly a month in 1916.

X122. Q. Aren't you mistaken about that? It was later in 1917 than that?

A. Later than 1917?

X123. Q. Yes?

A. No, sir.

X124. Q. Mr. Barbour left the employ of the Falls Company, didn't he? He was dismissed from the employ of the Falls Company?

A. Yes.

X125. Q. When was that?

A. I couldn't give the exact date. I think it was in the year 1917, however.

X126. Q. Did your employment up there in Mr. Barbour's office continue after he left, or did that end your period there?

A. I was in the compounding room when Mr. Barbour left.

X127. Q. You had already gone back there before he left?

A. Yes, sir.

X128. Q. How many men were there employed in the compounding room?

A. One.

X129. Q. You were the only man?

A. Yes, sir.

X130. Q. Who was the man while you were not in there, while you were up with Mr. Barbour?

A. Charles Smith.

X131. Q. This record that you have produced here, is a copy of one of the Falls Company's formulas that you made and appropriated to your own use?

A. Yes, sir.

X132. Q. Did you have copies of all the other formulas?

A. Yes.

X133. Have you got them now?

A. Yes, sir.

X134. Q. You still have all of them?

A. Yes, sir.

X135. Q. Haven't shown them to anybody?

A. I have, yes, sir.

X136. Q. Have you sold any of them?

A. No, sir.

X. 137. Q. Formulas of this sort came to you on cards from Mr. Kratz?

A. Yes, sir.

X138. Q. And this is just the way in which they came to you, so many pounds of each and so many ounces of each of these several ingredients?

A. Yes, sir.

X139. Q. And your job was to read here where it says, 27 pounds of so-and-so, and you would get out 27 pounds and put that in the mix?

A. Yes.

X140. Q. And you would do that with each of these eight or ten substances, and then you were through?

A. Yes. I would take it to the mill.

X141. Q. Have you any recollection of a substance that was known as No. 700?

A. No, sir.

X142. Q. You don't know what that was?

A. No, sir.

X143. Q. You would know what it was if you had ever used any of it, wouldn't you?

A. I probably would.

X144. Q. If you don't know what it was, you are quite sure that no such thing was ever used there?

A. I don't recall any 700.

X145. Q. But you said you would know if any 700 was used in that plant or ever compounded into a rubber mix. If you don't know of the use of any such thing, it must be that no such thing was ever used? Are you able to say whether any such thing as 700 was ever used?

A. I never heard of it being used, no sir.

X146. Q. If it had ever been used in that plant, you would know about it?

A. If it went through the compounding room I would have known about it, yes, sir.

X147. Q. If any such thing as that whatever went through the compounding room, you would be able to tell us now what that was?

A. I undoubtedly would.

X148. Q. Then you know that no such thing as No. 700 was ever compounded there while you were the compounding man. Is that a fact?

A. Yes, sir.

X149. Q. You are just as sure of that as you are of anything else you testified to, aren't you?

A. I am sure I never heard of it.

X150. Q. But you said it never was used. Is that still your testimony?

A. I am sure that I never used it, yes, sir.

X151. Q. You were the only compounding man, no one else could have used it?

A. Yes, sir.

X152. Q. No one else could have used it. Is that your testimony?

A. It may have been used in the laboratory.

X153. Q. I am talking about the compound that went into the factory. If any such thing as 700 were used in a compound that went into the mill room, you would know about it?

A. Yes, sir.

X154. Q. And, since you don't know about it, you know that it was not used?

A. It must not have been.

X155. Q. You still think you were back in the compounding room after your employment in Mr. Barbour's office, some time in 1917, even though you can't fix the date?

A. Yes, sir; I went back in the compounding room.

X156. Q. Then you know you were in the compounding room in 1918?

A. In 1918.

X157. Q. Yes?

A. In 1918 I was in there for a month or two.

X158. Q. For what months of 1918?

A. I would say in January and February, and possibly some of March.

X159. Q. What did you do when you left there?

A. I worked in the laboratory for a short while.

X160. Q. So you left the compounding room and went into the laboratory a little while before you left in May of 1918?

A. Yes, sir.

X161. Q. And you were in the compounding room in January and February and part of March?

A. I wouldn't say as to how much of March. I was in there a month or two after I got through breaking in a new man.

X162. Q. You were the only compounder in that room in those months of 1918?

A. Well, outside of the man that I was breaking in, yes, sir.

X163. Q. If you were breaking him in, you knew everything that he did?

A. Yes, sir.

X164. Q. So, except for this man with whose work you were entirely familiar, you were the only compounder during those months in 1918?

A. Yes, sir.

REDIRECT EXAMINATION.

By Mr. Wooster:

165. Q. Before you testified here did you discuss the matter of your testifying with any officer of the Falls Rubber Company?

A. I did, yes, sir.

166. Q. With whom?

A. Mr. M. J. O'Donnell.

167. Q. Did he object to your testifying here and discussing that T-8 formula?

A. No, sir, he did not.

JOSEPH HOFFMAN, having been produced on behalf of plaintiff in rebuttal, having been duly sworn, testified as follows:

DIRECT EXAMINATION.

By Mr. Wooster:

1. Q. Were you ever employed at the Falls Rubber Company?

A. Yes, sir.

2. Q. When?

A. In 1913.

3. Q. To when?

A. Until 1919.

4. Q. In what position?

A. Mill man, at the calendar.

5. Q. You were on the calendar in the mill room.

A. No, sir, on the mill.

6. Q. What did that machine do?

A. Warming up.

7. Q. Warming up what?

A. The stock.

8. Q. Where did that stock you got come from?

A. It came from the skids. They were on the skids when we got them.

9. Q. And how had that stock gotten on the skids?

A. From the mixers in the mixing room.

10. Q. Was the stock on the skids in batches or pieces, or in what form?

A. They were in batches.

11. Q. How much was in a batch?

A. One hundred pounds to a batch.

12. Q. Was it all in one piece or several pieces?

A. There was from five to six or seven hundred pounds on a skid.

13. Q. That would be the result of several batches?

A. Yes, sir.

14. Q. From the mill?

A. Yes, sir.

15. Q. Several batches on the mixing mill?

A. It depends on what batches you would mix. If you were mixing five or ten, you would put that many on the skids.

16. Q. What was the weight of a batch of tube stock?

A. One hundred pounds.

17. Q. So you would get on the skids which came to your warming mill, the equivalent of several batches of tube stock?

A. Yes, sir.

18. Q. What did you do with it?

A. Warmed it up.

19. Q. Then what did you do with it?

A. Had a man there to take it and carry it over to the mill, the calendar.

20. Q. How many batches did the calendar require in order to operate?

A. About two batches, to run the calendar. You couldn't run the calendar without having two batches.

21. Q. You mean you had to keep at least two batches in there to make it run?

A. Yes.

22. Q. What did you call that in terms, that you kept there?

A. For a bank.

23. Q. Was it common practice for separate stocks as small as two batches, to come through?

A. No, sir.

24. Q. In tube stocks, I mean.

A. No, sir.

25. Q. Did you know Mr. George D. Kratz?

A. Yes, sir.

26. Q. What was your position when he came there?

A. On the mill, warming up.

27. Q. And for the six months succeeding, what were you doing?

A. Still warming up.

28. Q. How far was your warming up mill to the mixing mill?

A. About ten feet apart.

29. Q. How many mixing mills were there?

A. Five.

30. Q. Do you remember any of the operators of those mixing mills in August and September, 1917?

A. Albert Rominsky and Albert Schmidt.

31. Q. Did all of these five run at once?

A. Two of them were down in the basement; the other three were up where I was.

32. Q. Who were the men on the other three mills in your room, in August and September, 1917?

A. That was Albert Rominsky and Albert Schmidt.

33. Q. Did Mr. Kratz come around that mill room?

A. Up and down, yes, sir.

34. Q. What did he do when he came there?

A. Nothing that I noticed. He walked around.

35. Q. Did he give orders to the men operating the machines?

A. No, sir.

36. Q. Who was the superior of the mill men?

A. Well, the mill men would get orders from the foreman.

37. Q. Who was the foreman in August and September, 1917?

A. Hoover Brady.

38. Q. Did you ever see Mr. Kratz watch a mixing operation?

A. He just went around and looked around.

39. Q. Did you ever see him put powders into compounds being mixed?

A. No, sir.

40. Q. How were batches marked or tagged, if at all?

A. A small white tag and marked with yellow crayon.

41. Q. What was on the tag?

A. The number of the stock.

42. Q. Did you ever see any red tags on stocks going through the mill room?

A. No, sir.

CROSS-EXAMINATION.

By Mr. Edmonds:

X43. Q. You at your warming-up mill received the rubber from these mixing mills?

A. Yes, sir.

X44. Q. And there were five of those mixing mills?

A Two of them downstairs, and three up where I was.

X45. Q. Did you watch all five of those mills all the time you were running them?

A. No, sir.

X46. Q. There may have been some going on at some of those in the course of several years, you didn't see?

A. I never seen them, unless I went down to see.

X47. Q. Were you ever sick in your life?

A. Well, I wasn't sick. I stayed away one day or so.

X48. Q. You might have stayed away a day in 1917?

A. Yes.

X49. Q. And might have stayed away two days?

A. No.

X50. Q. You couldn't have stayed away two days?

A. No. I stayed away about one day.

X51. Q. You may have taken a day off once in a while?

A. No.

X52. Q. Never took a day off?

A. No.

X53. Q. Just stayed there watching those five mixing mills?

A. I only watched the three.

X54. Q. Didn't watch the one you were working on?

A. That is the three.

X55. Q. Did you ever watch this warming-up mill you were working on?

A. I kept on watching, and I had a lot of spare time.

X56. Q. The spare time you devoted to watching these other three mills?

A. Anybody could walk along there. They were right close to me when I dropped them down.

X57. Q. What have you been doing since 1919?

A. Still working at the Marathon Rubber Company.

X58. Q. Have you been with the company since you left the Falls Rubber Company?

A. No, sir.

X59. Where else have you worked?

A. Oh, as a roustabout. I didn't do much of anything.

X60. Q. For a time you were a general roustabout?

A. Yes.

X61. Q. Didn't do much of anything?

A. No.

X62. Q. What time was that?

A. I couldn't say. I worked at different places, worked around carpentering, shoveling and such stuff as that.

X63. Q. Were you running this warming-up mill the whole time that you were with the Falls Company from 1913 to 1919?

A. No, sir.

X64. Q. What else did you do?

A. I was mixer at the old plant.

X65. Q. You mean the compounder, what your associate here called the compounder. Is that what you were doing?

A. How is that?

X66. Q. I say, by mixer do you mean the same as this Paul Shaw meant when he said compounder?

A. No.

X67. Q. What were you doing?

A. I was mixing.

X68. Q. Mixing what?

A. On the mill, the stock.

X69. Q. When did you do that?

A. In 1913 I started.

X70. Q. When did you stop?

A. I don't just remember just the year that we moved from the old factory over to the new plant. I don't remember.

X71. Q. Did you continue to do that as long as you stayed in the old plant?

A. Yes, sir.

X72. Q. And then when you went into the new plant, you started on this warming-up mill.

A. Warming-up, yes, sir.

X73. Q. And that meant operating this warming-up mill?

A. Yes, sir.

X74. Q. How many other mills were there at that time?

A. Two up and two down.

X75. Q. That is, when you started up at the new plant?

A. Yes, sir.

X76. Q. And when did you get another one?

A. I don't know. Just about a year or so later. I don't know exactly how long after.

X77. Q. It may have been three or four years?

A. No, it wasn't that long.

X78. Q. Within a year.

A. Well, something like that.

X79. Q. Something like a year?

A. Yes.

X80. Q. And that was two upstairs with the three other men?

A. The other two.

X81. Q. There must have been about four years that you were working in the new plant. Is that about right?

A. I don't exactly remember. I can't remember. I wouldn't say one way or the other. I can't remember just how long we were there.

X82. Q. Do you mean to say that in that period of four years, you never missed more than one day at a time from your work?

A. Well, I know that at that time, in 1917, I was in good health. I don't believe I missed but one or two days.

X83. Q. You didn't miss more than one or two days in 1917?

A. No, sir.

X84. Q. Are you sure you never were sick?

A. Not at that time, no.

X85. Q. Never were sick in 1918?

A. Yes.

X86. Q. You were sick in 1918?

A. Yes, sir, I was.

X87. Q. For how long?

A. About three or four days, at that one time.

X88. Q. So you were out from work three or four days?

A. Yes.

X89. Q. When in 1918 was that?

A. If I am not mistaken, it was in the fall.

RECESS.

AFTERNOON SESSION.

Thursday, October 15, 1925.

JOSEPH HOFFMAN resumes the stand.

CROSS-EXAMINATION (Continued).

By Mr. Edmonds:

X90. Q. In operating this warming-up mill, didn't you have to watch the operation of the mill pretty closely, in order to guard against injury?

A. Well, I was so used to it that I didn't pay much attention to the mill.

X91. Q. Didn't have to pay much attention to the mill?

A. No.

X92. Q. You know of many individuals having fingers nipped off in running that mill?

A. Oh, yes—saw lots of them.

X93. Q. But you were so expert you could look around the room and still run the machine?

A. Yes.

X94. Q. And that is what you did most of the time?

A. Yes, sir.

X95. Q. In fact, that is what you were finally dismissed from the company's mill for, wasn't it?

A. No, sir.

X96. Q. It wasn't for looking around the room when you should have been?

A. No.

X97. Q. Something different. Didn't you have to keep this warming mill running pretty fast?

A. I couldn't run it any faster than it would go.

X98. Q. No, but you had to keep it working pretty regular, in order to supply the calendars?

A. I kept it in, yes.

X99. Q. You had to keep the machine busy practically continually, didn't you, to turn out a sufficient supply?

A. I didn't have to spend much time on that.

X100. Q. I didn't hear you?

A. I didn't have to spend much time on that.

X101. Q. It didn't take much time to do that?

A. No.

X102. Q. Did I understand you to say that the batches run through the calendar were 200 pound batches?

A. Well, there were no 200 pound batches run through the mills, but it took 200 pounds to keep that one mill running.

X103. Q. How much was run through the calender at one time?

A. Well, enough there to make a roll.

X104. Q. You don't know how much it was?

A. That was about—I wouldn't say just exactly how much—how much the roll weighed after it was finished.

X105. Q. You don't know how much was in a batch that went through the calender?

A. No, sir; never paid no attention.

By Mr. Wooster:

X106. Q. What kind of stocks were milled on those two mills that were downstairs?

A. Black tread stocks.

PAUL A. SHAW, recalled for further cross-examination, testified as follows:

CROSS-EXAMINATION.

By Mr. Edmonds:

X168. Q. As I recall, you said that you were in the office of Mr. Barbour for a certain time, which I think you said was six or eight months. Is that correct?

A. It was possibly about that length of time, yes, sir.

X169. Q. Now, when did that period of service in Mr. Barbour's office end?

A. About the time, or a little before the time, of the first registration for the war, which was in June, 1917.

X170. Q. Now, when was it with relation to the time when Mr. Barbour severed his connection, or had his connection with the company severed?

A. I can't recall just what time Mr. Barbour left the company.

X171. Q. Yes, but were you in the office there with him at the time his employment came to an end?

A. No, sir.

X172. Q. How long before his employment came to an end did you stop?

A. I couldn't say.

X173. Q. You don't know anything about that?

A. I don't know when he left there.

X174. Q. When did you leave the office and go into the compounding room?

A. Around the latter part of May or first of June.

X175. Q. Was that while Barbour was still superintendent?

A. Yes, sir.

X176. Q. How long before his superintendency came to an end?

A. Well, I don't know when he left there.

X177. Q. You don't know how much longer he continued there after you went back to the compounding room?

A. I can't recall; no sir.

X178. Q. Who took your place in the compounding room when you went into the office?

A. In Mr. Barbour's office?

X179. Q. Yes?

A. Charles Smith.

X180. Q. Did you say that mannose R was the only accelerator used in that plant?

A. Yes, sir.

X181. Q. That was the only one?

A. Yes, sir.

X182. Q. Never heard of thio. being used?

A. No, sir.

X183. Q. In fact, you know it was not used.

A. Yes, sir.

X184. Q. And you never heard of an accelerator by the name of gum No. 3?

A. An accelerator?

X185. Q. Yes?

A. No, sir.

X186. Q. You know that no such article as that was used?

A. I beg your pardon?

X187. Q. Do you know that no such article as gum No. 3 was used in the compounding of batches?

A. Not as an accelerator, no, sir.

X188. Q. Was there such a thing as gum No. 3 used?

A. I wouldn't say positively, but I think we had sort of a cheap rubber that might have been called gum No. 3.

X189. Q. You don't know whether it was or not?

A. I wouldn't say positive, no, sir.

X190. Q. But if it was used, it was not an accelerator?

A. No, sir.

X191. Q. You said, I believe, that magnesia was used only in tubes, did you not?

A. No, sir.

X192. Q. What was it used in besides tubes?

A. We used magnesia in our friction.

X193. Q. What else?

A. I think we used it in bead stock—I can't just recall.

X194. Q. What else?

A. I couldn't say anything else.

X195. Q. Do you know anything that it was not used in?

A. I couldn't answer that just offhand.

X196. Q. Have you got any other T-8 formulas of the Falls Company?

A. Have I?

X197. Q. Yes; or a copy of them?

A. No, sir.

X198. Q. That one you produced is the only one you have?

A. Yes, sir.

X199. Q. Did you have it in the mill room from time to time?

A. Yes, sir.

X200. Q. Your duties as a compounder took you in there quite a bit?

A. Yes, sir.

X201. Q. Now you said that you had to measure out all of the ingredients that went into a rubber

batch, and that were called for by these cards? Is that right?

A. Yes, sir.

X202. Q. Every one that was on the card you yourself measured up?

A. Yes, sir.

X203. Q. Did you ever measure out any of the substance called rosin oil?

A. I didn't measure it by weight.

X204. Q. I say, did you do it?

A. No, sir.

X205. Q. You didn't do that?

A. No, sir.

X206. Q. Then you didn't measure out all the things that went into batches?

A. We never used rosin oil, as what you call part of the compound—in fact, we didn't use rosin oil all the time.

X207. Q. Did any of the cards that you saw specify rosin oil?

A. I don't remember.

X208. Q. But you know that if they did specify rosin oil, you didn't measure it out?

A. I took it to the mill, and they would have a little can there that they used, that they would measure it out themselves—I think about a quart.

X209. Q. The mill man would do that?

A. Yes, sir.

X210. Q. Now, in the period of your employment with the Falls Company were you ever absent?

A. Not very often.

X211. Q. Were you ever absent?

A. I would say that I may have been for a half day or a day.

X212. Q. Were you ever sick enough in those three or four years to be absent from the office—from the shop—for a day?

A. To be absent how?

X213. Q. I say, were you ever sick during that period of three or four years—sick enough to be absent from the plant for a day?

A. Not that I recall.

X214. Q. You may have been, but you don't recall?

A. No, sir.

X215. Q. Ever take a vacation?

A. No, sir.

X216. Q. Never took a vacation in four years?

A. I never laid off, no, sir.

X217. Q. Didn't take a vacation all the year round?

A. No, sir.

X218. Q. Never once in four years?

A. Not that I remember of; no, sir.

X219. Q. You said that there were times when you might have been away for a half day. Who compounded the mixtures while you were away?

A. I did.

X220. Q. You compounded them all?

A. I would put them up before I left.

X221. Q. Laid up a sufficient supply?

A. Yes, sir.

X222. Q. There wasn't anybody else in the plant that could do it?

A. That could do it?

X223. Q. Yes.

A. There was a man in the plant that could, but he never did.

X224. Q. Who broke down the rubber?

A. You mean, when they were mixing the batches?

X225. Q. Preparatory to mixing the batches, rubber had to be broken down, didn't it?

A. We don't break it down; no, sir.

X226. Q. Who did that?

A. We tore it apart in the compound room.

X227. Q. Who is "we?"

A. Well, I did it, but in case I got real busy I might get a man or two to come in for a half hour or so off the calender, or any extra man they had, to help tear a little bit of rubber apart.

X228. Q. Who were some of the men that tore down the rubber?

A. Well, I can't recall their names. There was a man that helped on the calender—I know there was a man by the name of Sayer that worked there, and he possibly would come in once in a while to help tear it apart.

By Mr. Wooster:

X229. Q. Was rosin oil regarded as an ingredient of the stock formula?

A. I would say that it was not.

X230. Q. It was a softener, wasn't it?

A. Yes, sir.

X231. Q. Used by the mill man to soften up the batch?

A. Yes.

X232. Q. So that the mill man would be the man that would call for it?

A. Yes, sir.

X233. Q. Not necessarily in the compound room?

A. Not necessarily, no, sir.

MUNROE H. DANIELS, recalled, testified as follows:

DIRECT EXAMINATION.

By Mr. Wooster:

172. Q. Did you hear the testimony of Mr. Bridgewater yesterday as to the X-book tests?

A. I did.

173. Q. Do you agree with his conclusions?

A. I do not. I can state that the way the tests appealed to me at the time—the way they look in the X-book show, according to the method that we had of evaluating stocks at the Republic in 1918 and 1919, that D. P. G. had a decided value in that shoddy stock which T. P. G. did not have, and it shortened the cure. At that time we were looking for something to get better results with our shoddies, and the difference in tensile which resulted, while not a great deal in pounds, amounts to a great deal figured on stock like the shoddy stock. We use shoddies in specification work where we have to reach a certain tensile, and a few pounds less than that tensile would mean the rejection of a considerable quantity of material.

174. Q. Will you look at X-book test 2005-G-H, X-2006-H, and state whether or not those tests are comparable.

A. Yes, they are comparable.

175. Q. Will you please compare them and state your understanding of what they show?

A. The 2005-G stock, with 3 per cent of T. P. G. has fifteen minute less cure, fifteen minute shorter cure, than the "H" stock; and while the tensile is quite a bit lower, the time is considerably lower. The 2006-H, having 2 per cent of diphenylguanidine, which is less accelerator in quantity—than 3 per cent of triphenylguanidine, has five minutes less cure, five pounds less steam, and a little less than 200 pounds greater tensile. That to me was very significant, in view of the fact that our shoddy stocks never showed very much snap in the ordinary compounding.

176. Q. Now, will you take X-book test—2059-D-E, 2039 blank, X-2039-A-C, and X-2067-E, and state whether or not those tests furnish basis for any conclusion as to relative actions of D. P. G. and T. P. G. in the stocks named?

A. Yes.

177. Q. Will you make the comparison?

A. They show, in general, that D. P. G. cut the time of cure over T. P. G.

By Mr. Edmonds:

178. Q. Which ones do you say show that?

A. 2039-H.

179. Q. 2039-H and what else?

By Mr. Wooster:

2039-A-C, 2039 blank, 2059-D-E, and 2067-E.

By Mr. Wooster:

180. Q. Referring to the defendant's exhibit, Stephens' letter, Exhibit "F,"—National Record, page 540—will you explain how that letter came to be written, including the footnote in handwriting?

A. Mr. Stephens was in New York and had given me a report on the sort of work he was doing. This involved considerable expense, especially the photostats that he was taking, and I considered we had enough information on T. P. G., and I wanted to get what he could find on D. P. G., so that the purpose of the letter was first, to tell him to shorten his work, and emphasize the fact that I wanted some information on D. P. G.

181. Q. What was the relation, if any, between your reference to diphenyl, in this letter of December 1, 1919, and your trip to the Chemical Society meeting at Philadelphia, between the preceding September 2 to 6?

A. There was no direct relation. I had gotten enough information from Weiss to have a distinct idea of going ahead and planning for the manufacture of D. P. G., and I wanted to inform Stephens he would have the job of either erecting a plant or changing the T. P. G. plant over to that effect.

CROSS-EXAMINATION.

By Mr. Edmonds:

X182. Q. You made some reference to page X-2039 of the 2000 X-book, columns blank, A and C, where tests with triphenylguanidine are recorded Those tests showed pretty good results, didn't they?

A. Yes, those are good results.

X183. Q. Very good, aren't they? For instance, in Column C, the tensile strength is 3230—pretty good, isn't it?

A. Yes.

X184. Q. Now, look back at the test that you referred to on X-2005, column G. You will note down at the bottom there it says, "was not mixed well." There must have been something the matter with that to cause one to put that inscription on there, and if that were so, wouldn't you think that would be a rather unsafe basis for comparison?

A. Well, that might refer to anything—I mean, it would not be a specific cause for rejection.

X185. Q. It might refer to anything?

A. (Witness does not answer).

C. A. CARLTON, recalled in rebuttal, testified as follows:

DIRECT EXAMINATION.

By Mr. Wooster:

51. Q. Will you state again when you entered the employ of the Republic Rubber Company?

A. June, 1917—that is, the first week in June.

52. Q. What did you do after you got there?

A. Well, I was hired specifically to do work on organic compounds, that is, accelerators.

53. Q. In order to commence that work, did you look over the records which you found there?

A. I did.

54. Q. Did you look at the 2000 X-book?

A. Yes, sir.

55. Q. How closely did you examine that book?

A. Very thoroughly, because it is my—or was my position, to continue whatever research work had been done on organic accelerators, and naturally I wanted to know what had been done previous to my going to the company.

56. Q. To the best of your recollection, when did you make this detailed examination of the 2000 X-book, relatively to when you went there?

A. Oh, very shortly after I entered the employ of the company.

57. Q. Within three or four months?

A. Oh, no—probably within the first week.

58. Q. Did you make any notes from this X-book —from these X-books—as to accelerators?

A. Not that I remember. There wasn't anything in these that I was particularly interested in.

59. Q. Was there anything in there that was new to you?

A. It had some of the exact tests, as far as showing the results—were new. If I remember rightly, all of the compounds that had been tested as accelerators were either in the literature or substances that were being used commercially at that time.

60. Q. To the best of your information and belief, state whether or not the reference "diphenylguanidine," on X-2005, in ink hand printing, appeared on that column when you first looked at that book?

By Mr. Edmonds:

I object to this question, if Your Honor please. This appears to be an effort by the plaintiff to impugn a document brought in here by plaintiff in the effort to prove its own case —in other words, they are trying to criticize their own documentary evidence. The book is brought in here by plaintiff and offered in evidence as a reliable document, presented by way of proving that Weiss did something at one time, and now they come around and say "This document is not a reliable document, and we do not want the Court to accept it." And I do not think that should be permitted. I object to the question as an obvious effort in that direction.

By Mr. Wooster:

That particular word, "diphenylguanidine," was disclaimed by Mr. Weiss at the time the record was put in, and we could not remove that handwriting from the page, but we did want the page in. The plaintiff in no way is impugning anything that it relies on or offers.

Objection overruled.

Exception noted to defendant.

A. It was not.

61. Q. What can you say as to some of the other things underneath, such as "D shoddy," "E shoddy," "C shoddy," "anhydroformaldehyde," "triphenylguanidine," and some of the others?

A. Well, answering that question, I can say that tests on hydroformaldehydeanilin and triphenylguanidine were recorded in the book. Whether or not they are on page 2005 I would not be able to state.

62. Q. Did you ever have occasion to examine this book after this first examination?

A. Certainly. This was given over to me—the book in which I recorded practically all the experiments that I carried on while at the Republic.

63. Q. Did you write that word "diphenylguanidine," on page X-2005?

A. I did not.

64. Q. What can you say as to when you last saw the book before leaving the employ of the Republic, regarding this entry?

A. You mean, when did I see the X-2000 book while in the employ of the company—is that the question?

65. Q. Have you any recollection as to when you last saw this page X-2005 before leaving the Republic?

A. Why, I probably saw it the last day I was there.

66. Q. When was that?

A. I can't state the exact date, but it was in March, 1918. If I remember rightly, it was nearer the end of March than the beginning, but I couldn't say positively. I never looked it up.

67. Q. When did this page X-2005, thereafter come to your attention?

A. Well, now, I can't say as to the exact date or whether or not it was this actual page. I had seen either the book or photostatic copies of it some time, I believe, in 1922.

68. Q. Did you ever have any discussion with Mr. Barrows respecting this page X-2005?

A. I don't know as I could answer that question with respect to this particular page. I did have discussion with regard to the word "diphenylguanidine" being in the X-book dated in 1917, I think it is.

69. Q. What was the occasion for the discussion?

A. Mr. Barrows came to see me at Mansfield, in connection with the case. He wrote me a letter relative to some missing pages, in this letter asking me if I could give him the address of Mr. Baldwin—I think he was trying to get in touch with Mr. Baldwin at that time—and in this letter he mentioned the fact that they had found these missing pages, and in his letter he made the statement that they had

found work evidently done by Mr. Baldwin recorded on these missing pages, and asked me what I knew about the case. Then I don't know whether he had been to see me before or after that—I can't state exactly as to that; but I remember we had a discussion at that time in regard to this word "diphenylguanidine," and I said, to the best of my knowledge and belief it was not in the book at the time I was at the Republic.

70. Q. You told Mr. Barrows this in 1922?

A. Yes, sir.

71 Q. Referring to the word "diphenylguanidine," on page X-2005, were you familiar with that word before you went with the Republic?

A. I don't believe so; that is, I don't believe that I had noticed diphenylguanidine in the literature. Of course, I knew there was such a substance possible, but I was not familiar with it.

72. Q. Where are you now employed?

A. Columbia Tire & Rubber Company, Mansfield, Ohio.

73. Q. Is T. P. G. used by this company in its commercial product?

By Mr. Edmonds:

What is the use of that? Is that rebuttal of anything?

By Mr. Wooster:

It certainly is.

By Mr. Edmonds:

Columbia Tire & Rubber Company—has that ever been mentioned?

By the Court:

What does this rebut?

By Mr. Wooster:

That is rebuttal of defendant's proposition that there is no utility of D. P. G. over T. P. G., concerning which the defendant used several days here, calling Mr. Bridgewater and other witnesses. It seems competent for plaintiff to show by other witnesses in rebuttal its ideas of the relative status of T. P. G. and D. P. G. in the practical art. Mr. Bridgewater gave some figures showing the total consumption of T. P. G. in the year 1924, and the plaintiff proposes to show the consumption of D. P. G. in that and other years, and also T. P. G. It is for the purpose of comparison.

By Mr. Edmonds:

This question is, does some company use something? I can't see that is rebuttal of anything.

By the Court:

Well, it is preliminary to the other, you say, by showing his knowledge of the use. Go ahead for the present.

A. It is not.

74. Q. Is D. P. G. used by your company in its commercial product?

A. Yes.

75. Q. Do you have anything to say as to what is or is not used as an accelerator in the product of your company?

A. Do you mean, do I decide that?

76. Q. Yes.

A. Yes.

77. Q. Did you make the decision to use D. P. G. rather than T. P. G.?

A. Yes.

78. Q. Will you state the reasons why you did that?

A. T. P. G. could not produce the results that I desired in the time in which we cured our compounds to anywheres near compete with D. P. G., as far as cost is concerned.

79. Q. What are the prices of D. P. G. and T. P. G.?

A. D. P. G. at the present time, average price is 95 cents a pound. T. P. G., I am not so familiar with the price at the present time. I would say that it is probably around 70 or 75 cents a pound.

80. Q. Why then would not T. P. G. be cheaper as an accelerator than D. P. G.?

A. Well, in the first place, even if the time of cure were such that you could produce it with T. P. G., it would take several times as much T. P. G. as D. P. G., so the final accelerator cost would be very much greater.

81. Q. In the testimony yesterday of Mr. Sanderson, it appeared that one part of D. P. G. was compared with eight parts of T. P. G. At that rate, would not 95 cents worth of D. P. G. be worth at least as much as several dollars' worth of T. P. G.?

A. It certainly would, in that compound.

CROSS-EXAMINATION.

By Mr. Edmonds:

X82. Q. Now, going back to this X-book, page 2005, I understand you to say that this word "diphenylguanidine" in the column at the left, was not there, but that these other entries, "D shoddy," "Z shoddy," "C shoddy" and then some long chemical name, and then some name "triphenylguanidine," were there?

A. No, that was not my answer. I said that to the best of my knowledge, "diphenylguanidine" was not in the book, that other substance, "hydroformaldehydeanilin" and "triphenylguanidine," and so forth, were in the book. I did not say that "C shoddy" or "D shoddy" were there or were not there. Neither did I say they were in this particular page.

X83. Q. Then you don't know anything about this page and the condition of this page when you went with the rubber company?

A. I made the statement. And my answer to that question is, that it was not in the book.

X84. Q. This page was not in the book?

A. No—Pardon me. The word "diphenylguanidine" was not in the book at the time I was at the Republic.

X85. Q. Was this inscription at the top, "Action of Organic Accel.," was that there?

A. I believe so. It was filled out—at least, it is not in my handwriting.

X86. Q. You think it was there?

A. I believe that was.

X87. Q. Under that is written "on shoddies" —was that there?

A. I couldn't say as to that. I know a good many of the headings were already filled in by others previous to my time.

X88. Q. You don't know whether "triphenylguanidine" was on there or not?

A. It was in the book. I wouldn't say it was on page X-2005, but it was in the book.

X89. Q. Was this other word—"hydro"—something?

A. "Hydroformaldehydeanilin"; yes, it was in the book.

X90. Q. You don't know where it was?

A. Not on what page, but I know it was in the book—in the early part of the book—because when I came there, if I remember rightly, it was only about the first eight or ten pages contained any information whatever about accelerators.

X91. Q. You think this inscription "on shoddies" was on there at the time?

A. I couldn't say, I have no idea.

X92. Q. Do you know anything about this entry, "X-2004-C," whether that was there?

A. I couldn't say as to that or not. All I remember about the entries in the book, as I said, were the actual organic compounds that were listed as accelerators, because that was what I was interested in and made a note of in my mind; because there wasn't anything in there at the time but what I knew of, either from the literature or my own personal experience.

X93. Q. Well, where was the entry of "triphenylguanidine" in the book?

A. I couldn't say as to what page. As I explained in my previous answers, it was in the first few pages of the book. It had been tried as an accelerator.

X94. Q. Triphenylguanidine had been tried as an accelerator and was entered in the book?

A. I believe so, to the best of my knowledge.

X95. Q. Well, is that a thing that you can be sure of, or is this just something you are stating on the basis of a recollection more or less distinct?

A. I know of triphenylguanidine, I know we used it while I was at the Republic, and tried it. I am not certain as to whether triphenylguanidine was a commercial product at that time or not. I was familiar with its preparation and use before I came with the Republic.

X96. Q. And you don't know whether it was entered in this book or not?

A. You mean, at the time I came?

X97. Q. At any time while you were there.

A. Why, yes, of course it was entered while I was there.

X98. Q. Well, was it entered when you got there—Let us limit the question about this. You said you examined the book before you started to make entries in it?

A. Yes.

X99. Q. Was it there when you examined the book?

A. I believe it was. I would not swear as to that.

X100. Q. What about this "anhydroformaldehyde," was that in the book?

A. Yes, sir.

X101. Q. That was in the book at the time you examined it, before you started to make entries?

A. Yes, sir.

X102. Q. Do you remember that distinctly?

A. Not distinctly—just that particular compound. Only by the fact that that was a well-known compound and had been used, and those entries are in Mr. Baldwin's handwriting, and were in there.

X103. Q. What about paraphenylenediamine—was that in the book?

A. It was.

X104. Q. At the time you examined it before putting any of your entries in it?

A. Yes, sir.

X105. Q. Now, will you look at the book and show us an entry of paraphenylenediamine that was in the book at the time you went there?

A. I see here is a substance marked "phenylenediamine," but there is no designation in front of it as to "para," but paraphenylenediamine was known in the art at that time, and would be the only phenylenediamine that you would imagine would be in there.

X106. Q. Now, look in the book and see if you find any entry of "triphenylguanidine?"

A. There is an entry, but I don't believe that was in my time—No, I guess that is all.

X107. Q. You don't find any?

A. No, I do not. I was not positive of "triphenylguanidine," as I stated before.

X108. Q. In this controversy over this Weiss patent, you have appeared at various times on both sides, haven't you?

A. Not that I remember appearing on both sides—just what do you mean by that?

X109. Q. In the course of the case in the Aniline suit, you gave affidavits on both sides, didn't you?

A. Oh, yes.

X110. Q. And in one of them you said you had talked with Mr. Weiss, and your recollection had been refreshed by your talk with him?

A. I don't remember of the exact contents of those.

X111. Q. You do recall that in substance, don't you?

A. I don't know as my mind was necessarily refreshed. I remember at the time the affidavit was first given the National Aniline, I knew absolutely nothing about the case except that a patent had been granted to Weiss—a representative of the National Aniline came to Kelly-Springfield Tire Company, and in talking with Mr. Peterson, got in touch with me, and, if I remember rightly, at that time he wanted to know if I could make any statement that would throw any light on the subject.

X112. Q. And at his request, you signed an affidavit?

By Mr. Wooster:

I object to this as outside the direct examination. This witness was only examined in regard to the entry in the X-book relating to diphenlyguanidine.

By the Court:

I think at any time, and in such case, when a witness is on the stand and has given any testimony, he can be cross-examined as to his credibility—that is, as to matters which may affect his credibility.

Objection overruled.

Exception noted to plaintiff.

(Question read).

A. Yes.

X113. Q. Then a short time after that an attorney, Mr. Barrows, representing the National Aniline Company, came and talked with you at Mansfield, Ohio?

A. I remember it was not a short time; it was quite some time. I don't remember the exact dates in either case.

X114. Q. Well, it was two months, to be exact.

A. I don't remember as to the time.

X115. Q. You understood in your talk with Mr. Barrows that he represented the National Aniline?

A. Positively.

X116. Q. And that in your talk with him you discussed this affidavit that you had made down at Cumberland?

A. I don't remember whether we discussed that particular affidavit or not. I guess we did.

X117. Q. You recall that in that interview with Mr. Barrows, you told him quite definitely that Mr. Weiss was not the inventor of diphenylguanidine?

A. I don't believe I made such a statement as that.

X118. Q. You also told Mr. Barrows where he could find other people who would corroborate your statement to that effect, didn't you?

A. I don't remember as Mr. Barrows and I had any particular discussion as to that point. I don't remember exactly.

X119. Q. Do you recall telling Mr. Barrows the name of some one that he could go to, who would corroborate all that you had said?

A. If I remember rightly, the situation was this: Mr. Barrows asked me if there were any other men in the Republic organization at the time Weiss was there, and myself, that he could get in touch with, and I did give him the name of—I think it gave him the name of Mr. Santon, who worked under me at that time.

X120. Q. Your present testimony is that that was purely general as to what other employees were there?

A. What do you mean by that?

X121. Q. Your reference to Mr. Santon—you merely refer to him as one who worked for the Republic, who could tell about conditions at Republic?

A. Well, at that time there weren't very many of us in the laboratory. I didn't have very many left to refer to.

X122. Q. The point I make is this: It is your

testimony now that you did not say that Weiss was not the inventor of diphenylguanidine, and that Santon would corroborate you in that fact? Is that correct?

A. I don't believe I made the statement in those terms. I certainly did not mean to convey that idea. Anything that I have said has been as near the truth as I know how to put it.

X123. Q. Then in the next month, in September, 1922, you saw Mr. Weiss in Pittsburgh?

A. Yes.

X124. Q. And shortly after that—the next month—you and Mr. Barrows met again at the hotel in Mansfield. Do you recall that?

A. What day was that?

X125. Q. October 8, 1922.

A. I have forgotten whether Mr. Barrows was at Mansfield more than once or not. If he was—I know I met him there once, I couldn't say the date.

X126. Q. Don't you recall that you had an interview with him, in which you said that you could not attend the trial, that your company would not permit you to attend the trial of the National Aniline suit?

A. I know we had—I talked to Mr. Barrows at Mansfield, I don't know as I ever made any statement that the company would not permit me to attend.

X127. Q. You have no recollection of that?

A. No, I have not.

X128. Q. Do you have any recollection of saying that you regretted signing the original affidavit that you signed down in Cumberland?

A. No, I don't know as I did.

X129. Q. Following that, you did appear at the trial of the National Aniline suit, and testified for the plaintiff?

A. Yes, sir.

X130. Q. And following that, you took a job with the Dovan Company?

A. Yes, sir.

X131. Q. I show you a document and ask you if this does not refresh your recollection that in an affidavit which you signed you stated: "The above facts were recalled to my mind by a conversation with Mr. Morris L. Weiss at the time of the meeting of the American Chemical Society in Pittsburgh, Pennsylvania, during the first week of September, 1922."

A. That is true. I would like, if permitted, to make just a slight explanation.

X132. Q. That is all that you were asked, so we will drop the matter there.

By the Court:

(To witness): You may make that later, if counsel for plaintiff desires to have it.

X133. Q. This document that I now hand you is the original of your first affidavit?

A. Yes.

By Mr. Edmonds:

I offer the paper just identified by the witness in evidence as Defendant's Exhibit "WW."

By Mr. Wooster:

Objected to as immaterial and incompetent.

Objection overruled.

Exception noted to defendant.

REDIRECT EXAMINATION.

By Mr. Wooster:

134. Q. What was the explanation which you wanted to make of one of your answers, and which was not permitted?

A. Why, I wanted to explain the position of myself in this matter. My first affidavit was given more or less at Mr. Peter's request that if I did know anything about the case, I should give it. I had forgotten entirely about it, I didn't want to get mixed up in it, I didn't want to appear for either side, because I was neutral at that time and am now. On meeting Mr. Weiss at the meeting of the American Chemical Society, he asked me if I would spend a little time with him and talk over the situation. He called to my attention—or asked me if I remembered the time that he brought the book Richter—organic chemistry book—to me and pointed out diphenylguanidine. That is exactly the case, and those statements are made in the affidavit, and to Mr. Weiss. At that time I had no idea of appearing as a witness for either side, and as I say again, the statements that are made in both affidavits are absolutely true, to the best of my knowledge, but my memory as regards that particular incident of having had Mr. Weiss call my attention to the word "D. P. G." in the book is absolutely the facts in the case.

135. Q. Did Mr. Barrows ever ask you to make an affidavit or testify that "diphenylguanidine" did appear in the X-book, when you first saw it?

A. I don't know as he did ask me right out to give an affidavit that it appeared. I wouldn't say that he did.

136. Q. Did you have any words with Mr. Barrows at any time?

A. You mean, in regard to this entry?

137 Q. Yes.

A. Yes. I don't know whether Mr. Barrows had the X-book or photostatic copies at the time he called on me in Mansfield, but we went over the X-book, as I remember, practically page by page, and I was pointing out the entries in that book that I remembered as being there when I was with the company, and I remember when we came to this page with "diphenylguanidine" marked on it, I looked at it, and of course first looked at the date, and the date entry was some time in 1917—or at least it was during the time of my employment with the Republic, and I stated to him at that time that to the best of my knowledge, the word "diphenylguanidine" was not in the book.

By Mr. Wooster:

To complete the record, I will offer as Plaintiff's Exhibit 14, affidavit of Mr. Carlton, in *Dovan vs. National*, verified November 7, 1922, this being the affidavit which was just shown him in cross-examination.

A. H. NELLEN, recalled in rebuttal, testified as follows:

DIRECT EXAMINATION.

By Mr. Wooster:

30. Q. When you went with the Republic, did you have anything to do with X-book 2000?

A. Not directly.

31. Q. Did you have anything to do with any of the X-books?

A. Yes, I had my own.

32. Q. Did you ever look at X-book 2000?

A. Yes, I did.

33. Q. When?

A. Well, I looked at it in 1917, when I was there first, and I also had a number of occasions to look at it during 1922, and subsequently.

34. Q. Is that the book here before you, which has heretofore been referred to?

A. Yes.

35. Q. What was the occasion for your looking at it in 1917?

A. Why, just in rather a casual manner, being in the office there, and while I did not make any entries in it, nevertheless I often looked at the formulas in it which we used for testing different materials.

36. Q. At that time did you see the word "diphenylguanidine" in it, that you remember?

A. I don't remember at that time whether I saw it or not.

37. Q. Did you after 1917 leave the Republic?

A. Yes.

38. Q. When was that?

A. On the first of February, 1919.

39. Q. And then you came back again?

A. Then I came back again after the war. Then I left again and came back again.

40. Q. During the second time you were with the Republic, did you see the word "diphenylguanidine" in this X-book?

A. No, I didn't have access to this book during that period of employment at all.

41. Q. Give me dates between which you were there for the third time?

A. Why, from the first of March, 1922, up to the present. Of course, the company is now owned by the Lee, and I am with the Lee Tire now.

42. Q. You went over with the Republic to Lee at the time Lee took over the Republic?

A. Well, I was transferred from the Republic factory to the Lee factory after the Lee Company bought the Republic.

43. Q. Did you see this X-book in 1922?

A. I did.

44. Q. What was the occasion for your looking at it then?

A. Well, I went back to the Republic in March, 1922, and shortly after that time, I believe, this patent was granted, and naturally it caused quite a bit of comment in their laboratory force. It happened that Eaton at that time had this book in his desk, and his desk and mine happened to be right next

to each other, and we were naturally friendly and talked together quite a bit, and we went over this book, and he showed me the book, and on one particular day I remember going through it quite thoroughly, to see if we could find out anything about the matter—just as a matter of curiosity, never thinking I would use the information again, but I did go through it very thoroughly, and I looked down along that lefthand column to find D. P. G. entries.

45. Q. Which pages did you look at?

A. Well, I looked all through the book.

46. Q. Do you recall any that you found in March, 1922, when you looked at this book?

A. I found a large number of entries of "diphenylguanidine," "diffendoe," "diphen," and so on.

47. Q. What is your recollection as to what you found on page X-2005?

A. To my recollection, that "diphenylguanidine" was not printed there at that time.

48. Q. How good is your recollection as to that?

A. I think it is very good.

49. Q. Did you thereafter see the X-book, and particularly this page?

A. I have been seeing it continuously from then until now. I have had it in my custody most of the time.

50. Q. Did you have occasion to look at this page X-2005 later than about March, 1922?

A. Well, after that time that I looked at it, which was some time in March or April of 1922,

it was out of the book some time. Then when it came back again, it had this on it.

CROSS EXAMINATION.

By Mr. Edmonds:

X51. Q. Where were you employed in January, February and March of 1920?

A. Firestone Tire & Rubber Company.

X52. Q. Do you recall that Mr. Weiss applied for employment there?

A. I do.

X53. Q. And he did not get it?

A. No, sir.

X54. Q. Did you have anything to do with that?

A. Nothing, except I happened to be the only friend of Mr. Weiss's who happened to be working at the Firestone, and I just happened to act as intermediary between him and Doc. Shepard, I just introduced him, that is all.

X55. Q. That is all, in connection with that incident?

A. That is all.

X56. Q. You are quite sure of that?

A. Positive.

VAN LEAR WOODWARD, recalled on behalf of plaintiff in rebuttal, testified as follows:

DIRECT EXAMINATION.

By Mr. Wooster:

91. Q. Mr. Woodward, did you ever examine the 2000 X-book?

A. I have.

92. Q. When?

A. The first time on May 11, 1922.

93. Q. What was the reason for that examination?

A. I went out accompanied by our attorney, Mr. Vaill, to investigate at the Republic Rubber Company's office the work that had been done by Mr. Weiss while he was employed by that company.

94. Q. What were you looking for?

A. We were looking to find out just exactly what he had done in connection with diphenylguanidine?

95. Q. What pages in the 2000 X-book did you examine?

A. I examined every page in the book.

96. Q. Is this the book (referring to 2000 X-book)?

A. Yes, this is the book.

97. Q. Were the pages there in consecutive order at that time?

A. Well, you can hardly call them consecutive order, because some had a number here (indicating), and the next number there, and some had blanks;

but so far as the numbers were concerned, they were consecutive.

98. Q. Well, was the book complete?

A. The book was complete, to the best of my knowledge.

99. Q. Do you recall anything particular that you observed about X-2005?

A. I do.

100. Q. 2006?

A. I do.

101. Q. Will you state what it is?

A. On page 2006, column H, there is a reference comparing that test, which contained diphenylguanidine, with page 2005, column H. I made that comparison, and noted that it was a comparison with the same compound, containing lime, and that right next to it, in column G, was a comparison with a compound exactly the same, excepting that it contained triphenylguanidine. In that I was very much interested, as at one time I had considered the manufacture of triphenylguanidine and had given it up, and this confirmed my opinion.

102. Q. Is that the only thing on page 2005 that you looked at?

A. I looked at everything there was on the page. My purpose was to find every entry of diphenylguanidine.

103. Q. There is an entry in hand ink printing, "diphenylguanidine." Now, on X-2005, the first column. What is your recollection as to whether or not that entry was there when you looked at this book?

A. That was not there.

104. Q. Are you positive of that?

A. Very positive.

105. Q. Did you see this book later?

A. I saw it on June 7, 1922.

106. Q. What was the occasion of seeing it then?

A. About a week, possibly, before that, Mr. Stephens, formerly an employee of the Republic Rubber Company, came to my office, and during a conversation told me that this Republic Rubber Company X-book had been brought to New York by an employee of the Republic Rubber Company, by name Mr. Eaton—

107. Q. Don't give hearsay, please.

A. I am not. This is what he told me. —and that he had attended a meeting at the National Aniline office, and that this book had been photostated from page to page, and he thought we would be interested in knowing it. I was making a trip to Akron in connection with this case, with Mr. Vaill, and on our way back to New York, we stopped off at Youngstown and made another visit to the plant. We made that visit—it was in Mr. Zieme's office in the laboratory, and I asked him why he had permitted the book to go out of his possession when at the first time I met him in this matter he said that both sides had had access to it, but that it couldn't go out. I then examined the book with Mr. Vaill, as we wanted to again go over some matters, some of the tests, dates and things, and to our surprise we very shortly found that this page 2005 was missing, because we endeavored to do the same

check-up that we had successfully done the first time, and it wasn't there. We then found that 2008 was missing at the same time.

108. Q. When did you next see the X-book?

A. I next saw the X-book in the latter part of December, 1922, at the New York office of the Republic Rubber Company.

109. Q. In what condition was it then?

A. It was entirely surrounded by books, with a glass over it, so that nobody could touch it.

110. Q. Was it complete or incomplete?

A. This page 2005 was back.

By Mr. Edmonds:

111. Q. What date was that?

A. It was the latter part of December, 1922.

By Mr. Wooster:

112. Q. Just before the trial of the Aniline Case?

A. Yes.

113. Q. Did you examine this page X-2005 then?

A. Did I examine it?

114. Q. Yes.

A. I certainly did.

115. Q. What was on it then?

A. This word in printing "diphenylguanidine" was on the page.

116. Q. Otherwise, how did it compare with the page as you had previously seen?

A. It had the figure "1" right alongside the "diphenylguanidine," and I think this total was put it, which had not been in before, this total "101.00." I don't recall any other change.

117. Q. Have you census reports for 1923 and 1924, showing statistics relating to synthetic and other organic chemicals?

A. Yes; we received them.

118. Q. Do these reports contain any references to sales of diphenylguanidine and triphenylguanidine?

A. They do.

119. Q. Will you point them out?

A. In the 1923 report, on page 28, it shows figures from six manufacturers showing sales during the year of 846,431 pounds of diphenylguanidine; on page 31, it lists triphenylguanidine and gives two manufacturers but no figures regarding sales or production. The 1924 report, on page 32, shows four manufacturers of diphenylguanidine, sales, 1,018,609 pounds; on page 35, it shows five manufacturers of triphenylguanidine, and sales of 340,829 pounds.

120. Q. If one part of diphenylguanidine replaces eight parts of triphenylguanidine, or vice versa, what is the ratio—approxmiate ratio—between the amounts of rubber respectively cured by diphenylguanidine and triphenylguanidine, assuming that the figures there reported went into rubber?

A. Will you ask that question again? You said something there about vice versa that threw me off.

121. Q. Well, take it either way. (Question read).

A. Approximately, on that ratio, 40,000 pounds of diphenylguanidine would accomplish the results claimed by 340,000 pounds of triphenylguanidine.

By the Court:

How do you make that out? Eight and one, wouldn't be 320?

By the Witness:

I said approximately, sir. I do not have the exact figures.

CROSS-EXAMINATION

By Mr. Edmonds:

X122. Q. Will you answer yes or no to this question? It is your testimony, as I understand it, that at that date in April when you saw this X-book, this word "diphenylguanidine" was not in the book, because if page 2005 had been missing from the book, you would have noticed that it was missing, and therefore it must have been present, and if it was present, and "diphenylguanidine" had been on it, you would have seen the "diphenylguanidine" on it?

A. I didn't see the book in April—you said "that date in April."

X123. Q. I said the month wrong. I meant May. Will you answer that question yes or no, with reference to May, 1922?

(Question read).

A. That sounds as though it had a couple of cross-purposes with it.

X124. Q. You may have it read again. It is a perfectly simple and direct question and I would like to have a direct answer.

A. I will answer that the page was not there at the time I saw it—I mean, that the page was there at the time I saw it in May, 1922.

X125. Q. Will you have the question read to you again, and see if you can answer it yes or no.

(Question again read).

A. I may be stupid, Your Honor, but that sounds to me like a double question.

By the Court:

X126. Q. If you can't answer that yes or no, say so?

A. I can't answer that yes or no.

By the Court:

It would be pretty difficult to follow it, Mr. Edmonds. I confess, it takes in a good many things.

By Mr. Edmonds:

I will take it step by step. I thought I could get it by one question.

By Mr. Edmonds:

X127. Q. The testimony that has been produced here is that on that day when you saw that book, that page 2005 was not in it. Now, I understand it is your testimony that the page was in, because, if it had not been there you would have noticed its absence?

A. Correct.

Q128. Q. That is correct. And I also understand you to say that the word "diphenylguanidine" was not on that page, because, had the page been there and the "diphenylguanidine" on it, you would have seen the "diphenylguanidine"?

A. Correct.

X129. Q. One further question I wanted to ask you is this: You are the individual, are you not, who was shown in this interference record to have sent your representative to see a witness called by your opponent, to try to tell him how to testify, are you not?

By Mr. Wooster:

I object to that. It is totally outside the direct examination, and not a correct statement of fact, anyway.

By the Court:

I don't see how it is proper cross-examination, Mr. Edmonds.

By Mr. Edmonds:

It relates only to his credibility. I don't believe the witness's testimony, and I think that this matter detracts from his credibility to such extent that it would not stand here.

By the Court:

You mean, the present witness or the other witness?

By Mr. Edmonds:

The present witness.

By the Court:

The fact he sent an agent to interview—

By Mr. Edmonds:

A witness called by his adversary, after he had had notice that the witness was to be called —to suggest to him that they would like to have the testimony so-and-so.

By the Court:

Well, that takes in a good many things. An interview of that kind might be perfectly proper, and the agent might have taken improper means. I don't think you can examine him on that.

By Mr. Edmonds:

I will withdraw the question, and, instead, will note on the record reference to pages 274, 275 and 276 of this Interference, where all of the details are set forth with great precision. That book is in evidence and reference can be made to it.

By Mr. Wooster:

I offer in evidence, as Plaintiff's Exhibits Nos. 15 and 16, respectively, the report of the Tariff Commission for 1923, No. 32, this being Plaintiff's Exhibit No. 15, and a similar report for 1924, No. 33, being Plaintiff's Exhibit No. 16.

CARL S. WILLIAMS, a witness produced on behalf of plaintiff in rebuttal, having been duly sworn, testified as follows:

DIRECT EXAMINATION.

By Mr. Wooster:

1. Q. What is your name, age, residence and occupation?

A. My name was just given; age, thirty-nine; residence, Woodbridge, N. J.; occupation, I am director of our Rubber Service Department—that is, the Roessler and Hasslacher Chemical Company.

2. Q. How long have you been director of this Rubber Service Department?

A. Since its establishment in 1917.

3. Q. What is the function of this rubber service department?

A. The investigation of accelerators of our own make, our competitors', the development of new accelerators, is the principal purpose—and of being of service to our customers in doing service work.

4. Q. Are you able to prepare chemical compounds and cure and test rubber and make comparisons?

A. That is one of the functions of my department.

5. Q. Will you state what your education has been in chemistry and in rubber work?

A. I graduated from the Ohio State University with a degree in chemistry, and directly from that—which was in 1913, I believe—I went with the U. S. Rubber Company, at their laboratory, general laboratory in New York, where I received a diversified training in rubber, covering tires and mechanicals, and boots and shoes, beltings, and I might say all types of rubber stocks. I spent part of my time at the different factories, to inspect the processes and get acquainted with the methods in use at that time. I was there something under three years—I don't remember the exact length of time—and then went into the employ of what was then the Perth Amboy Chemical Works, as a research chemist. They were making accelerators for the rubber trade, and there was a growing interest in accelerators, and it was my duty to keep abreast of the times and to develop new ma-

terials as I could, and to test them out. The actual laboratory, rubber laboratory itself, was established several years later—the date I gave before, as we felt the need of that laboratory for trying out our materials. I might add that we have tested many hundreds of new materials of various types. We have had a corps of a number of the best chemists we could employ for organic preparation work, and we still have such a corps. We have made series tests on all the common commercial accelerators, to determine their behavior with varying percentages of the accelerators with a combination of various percentages of sulphur, in the presence of zinc oxide and magnesium oxide—each one of these, you understand, is a series, not a single test; a series involves perhaps several hundred tests—carbon blacks, mineral rubbers, hard rubber stocks, soft rubber stocks. We make it as complete as we possibly can for evaluating the accelerator.

6. Q. Is it one of the functions of this rubber service department to aid rubber manufacturers and compounders as far as possible in the improvement of rubber?

A. Yes. Right from the start, that was one of the objects as set forth for the establishment of the laboratory. That was one of the principal reasons we established that—to give that service to our customers, and help them adopt our materials to their formulas, and I think we have been highly successful, as we have many clients taking advantage of that service.

7. Q. In this laboratory, what kind of equipment do you maintain for testing?

A. Well, we have the usual laboratory, mills and calendars and vulcanizing presses, and open heaters—what we call the open box heater, where the rubber is cured in just hot air—and then we have testing units to determine the physical properties of the rubber, among which we have recently developed a method of getting the stress-strain relation, which I consider one of the most important tests that you can submit a rubber sample to, showing the load necessary to give you a certain elongation.

8. Q. Within your experience, has any progress been made in the years since, say, the beginning of 1919, in the investigation of the problems of rubber?

A. Oh, yes; there has been considerable development. I think there have been numerous papers published showing developments. I believe Ira Williams has brought forth one development on plasticity. I might be mistaken on the author of that particular test.

9. Q. Are the tests to which rubber is put today more or less scientific and accurate than were available in 1919?

A. They are somewhat more accurate. There has been some good operative machines developed, which they did not have at that time, and, as I say, stress-strain machines have been developed, which they did not have at that time. They did have the ordinary type of Scott, Riehle & Olsen testing machines, that stretches the rubber until it breaks.

10. Q. I mean, today the testing of rubber is a more accurate and scientific determination than it was in 1919, is it not?

A. Oh, yes, indeed.

By Mr. Edmonds:

Is this qualification or rebuttal?

By Mr. Wooster:

This is still qualification.

11. Q. Did you attend the meeting of the American Chemical Society in Philadelphia in 1919?

A. I did.

12. Q. Did you make a report?

A. Yes, sir; I made a report to my company as soon as I got back.

13. Q. Will you produce that report?

Objected to as not rebuttal.

Objection overruled.

Exception noted to defendant.

A. I produce the report.

14. Q. Where has this report been since you made it?

A. It has been in the files of the Perth Amboy Chemical Works, at Perth Amboy.

By Mr. Wooster:

The witness produces report dated September 8, 1919, which is offered in evidence as Plaintiff's Exhibit No. 17.

Objected to as not rebuttal.

(Objection withdrawn.)

15. Q. Did this paper, as read by Dr. Kratz, afterwards come out in print?

A. Yes; it was subsequently printed in the technical journals.

16. Q. That is the paper that was published in April, 1920?

A. I believe that is the date.

17. Q. Was that paper as published identical with the lecture as given?

A. No, it was not. As I point out in that report, I mention that we were especially interested in that paper, in view of the fact that it explained the reaction of hexamethylenetetramine during the process of vulcanization. The statement was made, and a formula drawn on the blackboard, that this material broke down into thiourea, which is a sulphur compound, and I believe he stated that that was the true accelerator. That statement does not appear in the printed paper at all, and that was the one thing that interested me more than anything else in that paper.

11. Q. Did you see tables 1 and 2 of this paper, as published in April, 1920, Defendant's Exhibit "E." and put on the blackboard?

A. That is the table that was put on the blackboard.

19. Q. Tables 1 and 2?

A. Tables 1 and 2; yes. I believe they were both put on the blackboard.

20. Q. Was there any standard method of comparing accelerators in 1919?

A. There was a standard method which we used at the United States Rubber Company, which consisted in subjecting them to a series of tests somewhat similar to what I base my subsequent work on, and they were put on testing machines, to get the

tensile strength—actual tensile in pounds per square inch.

21. Q. Was that the same method as was followed in arriving at Table 1?

A. I saw no figures showing the relative tensile strength of the materials in Table 1. Whether there ever were any made, I don't know, but there was surely none presented in the paper. As I understand, they were made by what was then called "tooth-and-thumb" method—a method which I have never used, however, so I cannot judge of the accuracy of tests conducted in that manner—although I would hate to use that and make recommendations to my customers based on any such test. You have got to show the figures.

22. Q. Do you understand the method as described in the paper by which Table 2 was obtained?

By Mr. Edmonds:

If it was described in the paper, it is evidence without this witness saying anything about it.

By Mr. Wooster:

I asked him if he understands it.

By Mr. Edmonds:

Are you going to come to rebuttal testimony soon?

A. I believe that was rule-of-thumb method also. I don't see any other indication to the contrary.—Yes, it does show there are no sulphur estimations made, and there is no record made of any real physical tests being made as to quantity.

23. Q. What do you understand to be meant by the activity of an accelerator?

A. Why, the activity of an accelerator, as I understand it, is the summation of the improvements in the physical properties produced by an accelerator when correlated with the time necessary to produce such improvements. I certainly would not consider any one factor alone as being adjudged an estimate of activity of an accelerator. That term "activity" is a misnomer in itself.

24. Q. Are the figures, as given in Table 1, correct?

A. From what standpoint, may I ask?

25 Q. Are they accurate?

A. Well, I can say from my own tests that I have not been able to duplicate that table, that is, duplicate parts of it.

26. Q. Have you tried to duplicate it?

A. Yes; that is, I have tried certain members to see if there was a certain relation with the anilin. I tried diphenylguanidine and triphenylguanidine in the percentages mentioned here—Yes, I tried most of those accelerators.

27. Q. State whether or not by the use of the parts of the various substances given in Table 1, you would obtain the identical effect as stated?

A. I was not able to obtain them.

By Mr. Edmonds:

I object to all this as irrelevant. The figures in that table are the same figures that Weiss used, and that Weiss used in his application for employment at Firestone, and the same figures he said he used when he went to Doty & Woodward,

and asked for employment, when he said he imparted or disclosed diphenylguanidine. So this witness's testimony would not add anything.

By Mr. Wooster:

It does not appear in this record that Mr. Weiss ever used the figures in this Table 1 in applying to Firestone, nor in applying to Messrs. Doty & Woodward. This table has been advanced here by defendant as disclosure of the entire subject.

Objection overruled.

Exception noted to defendant.

28. Q. If you used one part of the anilin in a given compound, do you get the same result as if you used .075 of diphenylguanidine or monophenylguanidine, or if you used .5 of triphenylguanidine?

A. I was not able to duplicate that ratio at all. In fact, by adding the percentages which he specified here—that is, .075 of diphenylguanidine, in the formula which he mentions—I obtained a decrease in the tensile from the raw rubber without any accelerator whatsoever. I did that three times. It is not accidental. And, moreover, there is a published article by an author named Ames, who produced the same results; and that is a British publication, and I am sure it is unbiased. I believe there were three materials that gave me either a drop in the tensile or the same tensile, and those three were monophenylguanidine, diphenylguanidine, and I think the other was monophenylthiourea.

29. Q. Will you go on with that paper, particularly Tables 1 and 2, and the conclusions expressed

by the writers at the end of it, and state whether or no you agree with same, giving your reasons?

By Mr. Edmonds:

That is typical of the sort of testimony I think should not be admitted.

By the Court:

We will admit it, Mr. Edmonds, under your objection, and note you an exception.

A. Well, this first comparison says that the test should be based on the values obtained by the sulphur coefficients for the control which contains no accelerator. I do not see any control with no accelerator in this list. It says, "The action of certain substances, such as diphenylthiourea, is due to their tendency to decompose under vulcanizing conditions and temperatures into simpler substances which contain an active nitrogen group, which is responsible for the acceleration effected." I believe in the disclosure in this paper, he said that the activity of some of these bodies was due to the formation of anilin—breaks down into anilin—and we are led to believe that that is the active material; yet his table shows that anilin is less active than any of the materials which break down into that body.

We are led to believe, from No. 3, that "molecularly equivalent quantities of substances which contain the same active nitrogen group in their primary nucleus effect the same accelerating activity." I don't exactly get what he means by that, and I see no relation of that to the table. He says, "The replacement of the hydrogen in the active nitrogen group by other and larger groups, or radicals, decreases the

activity of the parent substance." That does not stand up under the fact he claims these materials broke down into anilin—that is, you would expect diphenylguanidine to produce one of anilin, and triphenylguanidine to produce two of anilin, phenyl mustard oil on the side in each case, and therefore triphenylguanidine should be more active than diphenylguanidine. I think that is an erroneous conclusion.

Under conclusion 5, he states the activity of these materials is based on the change of the valency in the nitrogen group. I am not prepared to say whether that is or not. I don't know.

30. Q. Under conclusion 4, he states that "the replacement of the hydrogen in the active nitrogen group by other and larger groups or radicals decreases the activity of the parent substance." Now, taking monophenylguanidine, diphenylguanidine and triphenylguanidine, which, according to that conclusion, should be the more active?

A. Monophenylguanidine.

31. Q. Why?

A. Because it only has one hydrogen replaced by a larger group, whereas triphenylguanidine has three hydrogens replaced. I might state there that one of those replacements is on what is known as the amino groups, which group is not definitely established as to its importance in acceleration work.

32. Q. Have you ever compared the strength of diphenylguanidine and monophenylguanidine?

A. Yes.

33. Q. Are they the same?

A. Well, they are very nearly the same, as far as my tests showed.

34. Q. What was the melting point of your diphenylguanidine?

A. Diphenylguanidine was—

35. Q. Your monophenylguanidine?

A. Monophenylguanidine melts—My material melted at 64 to 67—was the range over which it melted.

36. Q. In this paper, on page 12, monophenylguanidine is stated to melt at 193 degrees C. Would you say that that was the same or different material than your monophenylguanidine?

A. Well, it couldn't be the same, with that wide variation in melting point. If it was off just four or five degrees, perhaps, I would say that it might be, but not to that extent, by any means.

37. Q. Have you any idea, from the testimony of Mr. Kratz and from this paper, as to what the substance was, really was, which melts at 193 degrees C.?

A. I haven't the slightest idea of what that could be.

38. Q. Do you consider that sulphur coefficient is a proper way of evaluating accelerators?

A. It depends upon the purpose of your evaluation. If you just want a comparison of totals, to find which one causes the most sulphur to react on rubber at a certain time; yes. If you want to find the paramount degree of the qualities, I have not been able to find any correlation.

39. Q. What relation have you found between sulphur coefficient and the physical qualities of the

rubber, such as tensile, aging, set, elongation, and the other qualities you usually investigate rubber for?

A. There seems to be no relation. I have to base, however, that opinion largely from literature, as my sulphur determinations are very few and far between, but I can confirm that by my experiments, where I have used as low as one and one-half sulphur, and given quite long cures, so that I know that most of it goes in. That means that the sulphur coefficient could not possibly be greater than 1½ per cent., and with diphenylguanidine and some of these other rapid materials, we are able to get physical properties better than—fully as good as, or better than, the tests made over long lengths of cure, where 5 to 7 per cent. of sulphur has been added. The probability is, your sulphur coefficient is very much in excess of that.

40. Q. Will you explain what you mean by "sulphur coefficient"?

A. The sulphur coefficient that I am speaking of is the percentage of combined sulphur in the rubber. This is, if you have 100 rubber and 1½ parts of combined sulphur, then the coefficient is understood as 1½.

41. Q. And by "combined sulphur," you mean the sulphur which has been caused to go into combination with the rubber, as distinguished from the free sulphur, which did not combine?

A. That is right.

42. Q. Was this lecture at Philadelphia the first time you had heard diphenylguanidine suggested as an accelerator of rubber?

A. I believe so.

43. Q. When did you next hear of it?

A. The next time I heard of it was—

By Mr. Edmonds:

Is this rebuttal of something?

By Mr. Wooster:

Yes.

By Mr. Edmonds:

When this witness heard of something the second time, I can't see that that is rebuttal of anything.

By the Court:

I don't see that that is rebuttal. What are you contradicting, Mr. Wooster?

By Mr. Wooster:

I am proving the utility of diphenylguanidine over triphenylguanidine.

By the Court:

There was some testimony along that line. Go ahead.

A. Some time after I had received the sample of XLO—I believe it was in the summer of 1921, I am not quite certain of that—it was in the summer of 1921 that I learned of diphenylguanidine as such an accelerator. I had heard of XLO in the fall of 1920, receiving a sample of that material, which I tested out early in 1921.

44. Q. In your first test of XLO, what did you conclude the active principle to be?

A. I had an analysis made, and the melting point was all right, and corresponded to monophenylurea—I believe it was—it was very close, 146½ as against 147, and my conclusion at that time was that it was a monophenylurea, which of course I know now was in error.

45. Q. What did you later find XLO to be?

A. I don't know how I found out, but I later found out that it was diphenylguanidine. I don't recall whether I was informed by one of our agents, or who was the informant.

46. Q. Did you later test XLO and diphenylguanidine in comparison with hexa—

A. I made many tests.

47. Q. —and triphenylguanidine?

A. Yes, I made a great many tests. I must say that I never evaluated a material on a few isolated tests.

48. Q. You tested these various accelerators in the same compound, at different cures?

A. In similar compounds, yes—the same compound.

49. Q. And where you varied one ingredient for one accelerator, you went through that for the other?

A. Yes; that is my procedure.

50. Q. Will you compare hexamethylenetetramine, triphenylguanidine and diphenylguanidine?

A. In what respect?

51. Q. In respect to the time of cure, quantity required, cost of accelerator, qualities imparted to the rubber?

(Pending an answer to the above question, Court adjourned to Friday, October 16, 1925, at 10 o'clock, A. M.)

Friday, October 16, 1925.

MORNING SESSION.

CARL S. WILLIAMS resumed the stand.

DIRECT EXAMINATION (continued).

By Mr. Wooster:

52. Q. At adjournment yesterday, you were requested to compare hexamethylenetetramine with triphenylguanidine and diphenylguanidine, in respect to times of cures, quantities required, costs and qualities imparted to the rubber. In making this, please make it as briefly as you can.

A. In comparing diphenylguanidine with triphenylguanidine, it has been our experience through many tests that triphenylguanidine takes very much longer times, periods of times, to obtain the optimum cure. When those optimum cures have been reached the tensiles obtained are not as great as obtained with diphenylguanidine. The quantities necessary to be used for triphenylguanidine are, as have been shown many times here, much greater than for diphenylguanidine.

In reference to hexamethylenetetramine, the difference is not so marked. If it is possible to evaluate this in exact terms, regarding their relative activities as defined in my definitions yesterday, I would say that one-half a part of diphenylguanidine is very close to the equivalent of one hexa. Of course this ratio

varies with different stocks, and it is impossible to make one ratio hold for all those stocks. I wish to quote or read from some of my reports; just the conclusions. I will not bother the Court with the figures. It is the report of February 4, 1921, signed by my assistant, Mr. Culver, and made under my directions and supervision. "The tensiles obtained by using XLO in pure gum stock are approximately 20 per cent. greater than those obtained with hexa. XLO gives tensiles of approximately 45 per cent. greater than those obtained with hexa, when used with a magnesia stock. By that I mean a stock containing magnesium oxide. The tensiles obtained by using XLO in zinc stock are greater than those obtained by using hexa. XLO reaches its maximum tensile in a cure that is from one-quarter hour to one-half hour shorter than that required by hexa."

I also wish to quote my own letter to our Mr. Dill, who was on the stand here a few days ago. It is dated February 7, 1921. I am speaking of XLO and I say, "Our tests on this material, copy of which we are enclosing, show it to be superior to hexa under all conditions tried. It not only produces a tougher stock but produces it in a shorter length of time than can be produced by hexa. Altho I have not completely established the identity of this material, I have conducted some tests which indicate it to be phenyl-urea. The material as marketed is a mixture of about equal parts chalk and active ingredient. This material is such a threatening competitor that we should take some steps to combat it. I would suggest the best means as being to make it and sell it our-

selves under its true name, if this can be accomplished."

I now quote from the report of Mr. Rose, who is also my assistant, and worked under my direction and supervision—

By Mr. Edmonds:

Will your Honor want it on the record? I object to it as irrelevant.

By the Court:

It may go in.

A. It is dated November 4, 1921: "Conclusions. XLO produces a stock superior to that produced by hexa. and in a shorter time. Diphenylguanidine showed a decided superiority over hexa. in both groups used" (this is a different mix of cures that he refers to), "exceedingly high tensiles being produced."

I also quote my letter to Mr. Dill, dated March 25, 1922, which date I believe is prior to the issuance of the Weiss patent. I will read only the last sentence now, "We cannot help but consider that this accelerator is the best accelerator for tire stocks that we have yet come across." The entire letter is as follows: "Mr. C. Dill, Asst. to 2nd Vice Pres. My dear Mr. Dill: Accelerators. We are attaching complete reports on tests made recently on various accelerators. I wish to draw particular attention to the results shown for diphenylguanidine. It appears from these tests that diphenylguanidine is very much more rapid than hexa. in all stocks tried. The tensiles produced in a stock containing a small amount of zinc were very nearly the same for the two materials, but

the period of maximum cure is very much shorter for that of diphenylguanidine. When tried in the stocks containing a high zinc content we find that the speed of the reaction of diphenylguanidine is very striking. When operating at 307° F., corresponding to a pressure of 60 lbs., we find that we are able to produce a tensile strength of 3446 lbs. in 5 minutes, whereas the maximum under the same condition for Hexa is only 2687 lbs. which is produced in 30 minutes. Also for these two stocks we find that the elongation for diphenylguanidine is 730 as against 520 for hexa. which shows that the diphenylguanidine has produced a better stock physically than the Hexa produced. At 50 lbs. and 40 lbs. the length of time necessary for maximum cures when using diphenylguanidines are about ¼ as long as it is necessary to cure to the maximum when using Hexa. At the same time the diphenylguanidine stocks in every case show a very much superior maximum tensile strength. These results would show that if a tire manufacturer used diphenylguanidine as his accelerator, he would be able to produce a very superior article by using a low per cent. of diphenylguanidine and curing for a fairly long period at a low temperature. In this manner he would be able to thoroughly heat his tire thru, which would facilitate the proper vulcanization of the underlayers, that is, skim coat, friction and breaker. The formulas for the underlying stocks could readily be adjusted by putting a slightly larger quantity of diphenylguanidine in them so that they would reach their optimum cure at the same time that the outer coat or tread reached its optimum cure. We cannot help but consider that this accelerator is

the best accelerator for tire stocks that we have yet come across. Very truly yours, Perth Amboy Chemical Works, C. S. Williams, Assistant Works Manager."

By the Court:

53. Q. How long had you been acquainted with that product XLO?

A. The first I heard about XLO was in the fall of 1920. Our salesmen and service men were getting reports that this new accelerator was making inroads on our business, and I immediately obtained a ten pound sample and conducted tests on that ten pound sample. I found it was a very rapid material, and urged in a letter to Mr. Dill, in the early part of 1921, that we analyze this material and find out what it is, and if possible market it under its true name, rather than calling it XLO.

Now, comparing diphenylguanidine with hexa. and thio., that is part of my conclusions. The relative costs of these substances I think Mr. Woodward has already shown to the Court that eight parts of triphenylguanidine, costs a great deal more than one part of diphenylguanidine, which seems to be the ratio admitted as being equivalent. Hexa. costs a little bit more than diphenylguanidine, to use.

By Mr. Wooster:

54. Q. Can you produce a bottle of diphenylguanidine, about an inch in diameter and several inches tall, as referred to by Mr. Baldwin?

A. Yes, sir; I have it here.

55. Q. Will you describe this bottle; what the figures on it mean?

A. This bottle is about 1-1/16 in diameter, and approximately 5 inches tall. We have added diphenylguanidine in five gram portions and calipered the strip on the side where these five come. The first five grams lie below my finger there (indicating).

56. Q. And the total amount is about what?

A. 35 grams exactly.

By Mr. Wooster:

I offer in evidence as Plaintiff's Exhibit No. 18, a graduate bottle containing diphenylguanidine.

57. Q. Have you ever made monophenylguanidine?

A. Yes.

58. Q. Did you get a melting point which agreed with that, as given by Mr. Kratz in his paper, of 193?

By the Court:

I don't know what you propose to prove in that regard. Is it to rebut something?

By Mr. Wooster:

Yes. That is, that Mr. Kratz did not have monophenylguanidine, and therefore had no basis in his paper for the alleged comparison given by him of the same activity. This paper is wrong in that respect.

By the Court:

This is now to rebut the testimony of what witness or what testimony?

By Mr. Wooster:

It is to rebut what is shown by the defendant's exhibit Kratz paper, as to the equal activity of monophenylguanidine and diphenylguanidine.

By the Court:

It is, in effect, a criticism of that paper. Go on.

A. The point we obtained is 66 degrees. To be more exact, between 64 and 67.

By Mr. Wooster:

59. Q. How was that substance prepared?

A. That was prepared by the action of free cyandiamid on anilin-hydrochloride.

60. Q. Have you a published reference to that method?

A. I believe it first appeared in about 1887. The author of it I do not know, but it was followed up and elaborated on by Prof. McKee, of Columbia University, who made it by that method, and described its properties, and called it monophenylguanidine.

61. Q. Will you look at the page I show you from the American Chemical Journal of 1901, vol. 26, page 221, and state what that is?

A. This describes the method which I just also described for making the monophenylguanidine. It gives the melting point as being 66. It says, "It decomposes on attempt to distill it and the free base is hydro , and takes up carbon dioxide. For identification, various derivatives were made." This is the article by McKee, although the name does not appear on this sheet.

By Mr. Wooster:

This photostat is offered in evidence as Plaintiff's Exhibit No. 19, being a photostat of American Chemical Society Journal, page 221, preparation of monophenylguanidine.

62. Q. I show you a chart, and ask you to state what it is?

A. This chart shows the relative activity as given by Mr. Kratz in his Table 1 and Table 4 of three substances, anilin, diphenylthiourea and triphenylguanidine. I have taken those three because they are the only ones that appear in both tables. In the first table, the equivalent amounts are, one of anilin to 85/100 of thiourea, and 50/100 of triphenylguanidine. In Table 4, he uses 40/100 parts of anilin, and obtains a sulphur coefficient of 3.6; with diphenylthiourea, one part of the material is used and gives a sulphur coefficient of 3.078. In triphenylguanidine, he uses 1.25, being about three times the amount of anilin, and gets a sulphur coefficient of 3.87, being only slightly greater than he obtained with 40/100 of aniline.

By Mr. Wooster:

The chart is offered in evidence as Plaintiff's Exhibit No. 20.

63. Q. Have you read and do you understand the disclosure of the Weiss patent in suit, No. 1,411,231?

A. Yes, sir.

64. Q. In this patent is given, by way of example, a formula consisting of 50 parts new rubber,

45.3 of zinc oxide, 3.5 sulphur, 1 part diphenylguanidine, to be cured for 10 to 20 minutes, at about 40 pounds per square inch. What kind of goods will that formula exactly as stated produce?

A. You could produce with that formula a very good quality of tennis balls, toys, rubber gloves, certain grades of rubber heels, white soles of tennis shoes, soft gaskets, white aprons, hospital sheeting, door stops, miscellaneous bumpers, and a big use would be for tire rubber stocks, inner tube patches, white tubing, white hose, water bottles, ice packs, jar rings, miscellaneous toys, rubber stoppers and caps, flush tank bulbs, and I think we could go on ad infinitum pretty nearly.

65. Q. I show you a chart which has been put out some time ago, by a manufacturer of diphenylguanidine and other accelerators for the vulcanization of rubber, showing a cross section of an automobile tire, with eleven different compounds mentioned therein, of which diphenylguanidine is mentioned in nine. Does that chart indicate correctly the places where diphenylguanidine may be used in an automobile tire and inner tube?

By Mr. Edmonds:

Of what is this rebuttal?

By Mr. Wooster:

It is in rebuttal of witnesses for the defendant, who said that this patent lacked utility and in substance that it was inoperative.

By The Court:

There was testimony in regard to the comparison to some other, as to certain of the re-

sults claimed, and it may be to the extent of the utility as claimed for it; but there was none which absolutely denies it, as I recollect.

By Mr. Wooster:

But they claimed the disclosure of the patent was insufficient.

By the Court:

It seems so absolutely and utterly remote from any consideration the Court would give to that phase of it, when, as counsel just stated, they have an admission upon the record as to the use of the substance. Now, I will say to you that in so far as that is concerned, you are wasting your own time and the time of the Court by the introduction of that testimony, if that is the only purpose of it.

By Mr. Wooster:

I will not press it.

66. Q. I show you a chart and will ask you to state what it is?

A. This is again the chart as given by Kratz in his paper, showing the relative equivalent amounts of various accelerators. The first column shows the figures as actually given by Kratz. The second column shows these figures converted into per cents, based on the gum used. The third column represents the figures in the same ratio, multiplied by the same factor, so that it brings diphenylguanidine to the quantity or near the quantity suggested in the patent; that is, two per cent. The last column shows this conversion to the ratios, bringing the diphenyl-

guanidine to the quantity used by defendant. I will cite the third column only. If I bring the percentage that is this ratio multiplied by the factor of diphenylguanidine, up to approximately two, up to exactly 1.95, it would mean that to obtain the same relative activity we must add 26 per cent. of anilin, which of course every rubber compounder knows is impossible. You cannot add it. The stock would run all over the floor. It is very soft. It also shows that you would have to use 22.1 parts of thiocarbanilid, 11.95 anhydroformaldehydeanilin. These quantities of course we know are absurd for use as accelerators in vulcanization.

67. Q. In your opinion, if you did use the amounts corresponding to the third column, would you get the same result in the case of each of those accelerators as is stated to be obtained in the patent in suit, by using the percentage of D. P. G. equaling 2 per cent. of the rubber?

A. The results would be absolutely impossible. They would be out of alignment. You couldn't get a cured stock containing 26 parts of anilin. If you would vulcanize that I don't think you could get it out of the mold; it would be in a flowing condition.

CROSS-EXAMINATION.

By Mr. Edmonds:

X68. Q. Did Roessler and Hasslacher make hexa.?

A. Yes.

X69. Q. And sold it to the tire companies?

A. Yes.

X70. Q. Did those companies make tires?

A. No.

X71. Q. In the tests on which you based your conclusions this morning, those tests were made with the same compound except for the accelerators and with the different accelerators in equal amounts, and the compound cured for an equal time?

A. No; not necessarily.

X72. Q. But the amounts in the accelerators were the same in the comparative tests you used?

A. The tests I have stated covered a great many comparisons. Some, as in this first one, are made on equal quantities. I have other tests here in which I have varied the quantities over quite a range.

X73. Q. But when you said in discussing the conclusions based on this first paper, that the tensiles obtained by using XLO are 20 per cent. greater, you referred to tests using equal amounts of hexa. and whatever the other accelerator was?

A. Yes.

DR. GEORGE STAFFORD WHITBY, recalled on behalf of plaintiff in rebuttal, testified as follows:

DIRECT EXAMINATION.

By Mr. Wooster:

192. Q. Have you heard the testimony of witnesses for the defendant and plaintiff as to the paper by Messrs. Kratz, Flower and Coolidge, published April, 1920, relating to comparisons of accelerators?

A. Yes, sir.

193. Q. Will you state your opinion as to what

that paper actually gave to the rubber world, giving your reasons?

By Mr. Edmonds:

I don't think that is a proper question. What is in the paper and what is written there now, and what one reads on the page, is the only thing that is of consequence. If counsel thinks there is something there that the Court cannot understand by reading it, he should be permitted to question about that, but nothing beyond that.

By Mr. Wooster:

194. Q. Does the paper by Mr. Kratz accurately state the relative activities of the substances mentioned?

A. No.

195. Q. Please give your reasons?

A. The figure given by Mr. Kratz for the relative activity of a variety of substances—I am especially referring to the figures in his Table 1—are grossly erroneous. The paper as a whole, considered as a whole, is inconsistent in itself. His results are inconsistent with the previous work he did at Norwalk. And furthermore, in so far as in later articles he reconsidered some of the matters dealt with in that April, 1920, paper, he entirely altered his position, and stated in effect that the previous conclusions were erroneous.

196. Q. In your opinion, if triphenylguanidine was known in the art as an accelerator of the vulcanization of rubber, could it have been predicated that diphenylguanidine would be an accelerator?

A. No.

197. Q. Will you give your reasons?

A. Because in considering triphenylguanidine and diphenylguanidine one finds that the main difference between them is a difference in the substitution. In passing from triphenylguanidine to diphenylguanidine we are confusing the substances. Now, there is no principle by which it could have been predicted that such a reduction of the substitution would have increased the accelerating properties, or even that it would have given you a substance that wasn't an accelerator at all. I have prepared a chart showing that in many cases a change of substitution may actually entirely destroy all the accelerating properties, or it may diminish them to a tremendous extent, so as to convert what was a superior accelerator to an extremely weak accelerator. I don't think I need go over all those examples, but these are perfectly well recognized cases. I might take as a typical one a case which is mentioned in the paper by Kratz, Flower and Shapiro, in January, 1921. They find there that hydrazinebenzol, which is hydrazine with two phenyl groups—let us say diphenylguanidine—accelerates vulcanization; whereas monophenylhydrazine actually retards vulcanization. So if there is a diminution in the amount of substitution, it actually destroys all accelerating power.

By Mr. Wooster:

The chart produced by the witness is offered in evidence as Plaintiff's Exhibit No. 21, Whitby Chart showing effect of Substitutions.

198. Q. With an aminoguanidine mentioned in the Dubosc article of 1919 as an accelerator, in your

opinion, could that disclosure enable one to predicate that diphenylguanidine would be an accelerator?

A. No. I have given examples on the chart showing that the removal of an amino group may give a substance which has no accelerating power whatever. Therefore, it could not have been predicted, because aminoguanidine, or diaminoguanidine, is not an accelerator. I may say that the same applies to any suggestion that might be made that it could be predicted that phenylguanidines would be accelerators.

199. Q. To your knowledge, has diaminoguanidine ever been prepared in a free state?

A. No; it cannot be prepared in a free state.

200. Q. Mr. Bridgwater discussed his understanding of the meaning of the term "substitution," as applied to diphenyl and other guanidines. Will you state whether or not you agree with that understanding as expressed by Mr. Bridgwater, and state your reasons?

A. No, I don't agree with Mr. Bridgwater's definition, and I may say I have given some rather close consideration to questions of commercial nomenclature, as I happen to be a member of the International Committee on the Reforming of Nomenclature of Organic Chemistry, and it appears to be obvious that the term "substitution" implies that a mere substitution is contemplated; that is to say, a change which shall not destroy the fundamental character of the material in question; that the material obtained shall be able to function in substantially the same way as the original material, and that undoubtedly is the meaning of the substitution contemplated in the patent, and it also, in my view, would be very good from

a strictly chemical point of view, that any change which alters the character of a compound fundamentally cannot certainly be considered as a substitution. Such compounds as dibenzolguanidines are not disubstituted guanidines, and when you introduce the sulphonic group, as in some of the compounds submitted, you are certainly entirely altering the character of your compound, and in my opinion you will not really make a substitution.

By Mr. Wooster:

With the offer of some exhibits, plaintiff's rebuttal will be closed.

CROSS-EXAMINATION.

By Mr. Edmonds:

X201. Q. You have changed your mind about the Kratz paper since the time it first came to your attention?

A. I think not.

X202. Q. In your letter to Mr. Kratz, of October 30, 1919, do you find the statement, "So far as I can judge from the abstract the paper of yourself, Flower and Coolidge, on accelerators, is remarkably interesting and satisfactory"?

A. Yes, but one couldn't judge very far from the abstract, which gave no quantitive figures, and certainly did not include any figures of the relative activity of accelerators, and did not include his theory as to the mode of action.

X203. Q. And when you referred to this paper which was published in 1920 as a paper which might be referred to for information on accelerators, did you

think it worth while to say you didn't agree with it, and thought it was wrong?

A. No; because in the first place I was not acquainted with his Norwalk work, and which, as I say, is entirely inconsistent with his subsequent work, assuming that he carried out this experiment that he embodies in Table 1. Furthermore, his paper of April, 1922, or February, in which he throws over all the work in his 1920 paper, he reconsiders, had not appeared when I wrote him.

X204. Q. How long have you known the facts on which you now base your criticism of this Kratz paper?

A. Some of those facts are actually mentioned in that letter, because if you will refer to that letter you will find there is a criticism of the paper, to the effect that he failed to carry out tensile tests on his record.

X205. Q. And other criticism you have made quite recently?

A. No; because in Mr. Kratz's paper of April, 1921, he entirely contradicts, and as I believe shows the substitution to be erroneous.

X206. Q. You haven't learned anything recently about the things you criticized, the exact figures in his Table 1?

A. Naturally, I am using some of my more recently acquired knowledge; but there is already a paper in the journal of the Society of Chemical Industry, about on May 10, 1920, by Twiss, the results of which show that Kratz was entirely in error with regard to thiocarbanilid.

By Mr. Wooster:

To close plaintiff's case, and without recalling Mr. Doty, I would like to offer a chart showing a comparison of accelerators, as based on experiments made by Mr. Doty and used in the National trial.

By Mr. Edmonds:

I object to this as irrelevant, because it is a perfectly useless thing in the respect that it is a part of curves of different accelerators of different accelerating values, used in the same amount, which is obviously a foolish thing to do.

By the Court:

We will allow it to be admitted.

By Mr. Wooster:

I offer it as Plaintiff's Exhibit No. 22.

By Mr. Wooster:

I also offer India Rubber World of December 1, 1919, pages 137 to 140, inclusive, article by D. F. Cranor, being Exhibit No. 23.

I also offer Patent to George D. Kratz, No. 1,428,040, filed May 26, 1919, for a tire, to show that the mind of Mr. Kratz was not on diphenylguanidine at that time; being Exhibit No. 24.

Also, the Rubber Age of February 25, 1921, pages 401 and 403, article by Kratz, Flower and Shapiro, relating to the action of certain organic accelerators in the vulcanization of rubber; being Exhibit No. 25.

I also offer in evidence paper by W. M. Ames in the Journal of the Society of Chemical Indus-

try, of April 25, 1924, pages 117-T and 125-T; being Exhibit 26.

I also offer page 740, of the India Rubber World, of July 1, 1921, an article relating to XLO, being Exhibit No. 27.

I also offer photostat of pages 283 and 284 of Berichte, 1905, vol. 38, Sec. 53, article by Pellizzari and Cantoni, on diamino guanidine, being Exhibit No. 28.

I also offer from the India Rubber Journal of May 20, 1922, pages 17 to 21, inclusive, an article by Dr. Lothar Weber, on Survey of Accelerators, being Exhibit No. 29.

I also offer a copy of the application of Morris L. Weiss, filed August 8, 1921, Serial No. 490,746, being the applicaion involved in the *Scott vs. Weiss vs. Heuser Interference,* the record heretofore offered. This copy is uncertified, but is accepted by defendant, being marked Exhibit No. 30.

I also offer to read into the record Rule 75 of the Rules of Practice of the United States Patent Office, which was in force in 1921 and 1922, the same being as follows:

> "75. When an original or reissue application is rejected on reference to an expired or unexpired domestic patent, which substantially shows or describes but does not claim the rejected invention, or on reference to a foreign patent or to a printed publication, and the applicant shall make oath to facts showing the completion of the invention in this country, before the filing of the applica-

tion on which the domestic patent issued, or before the date of the foreign patent, or before the date of the printed publication, and shall also make oath that he does not know and does not believe that the invention has been in public use or on sale in this country, or patented or described in a printed publication in this or any foreign country for more than two years prior to his application, and that he has never abandoned the invention, then the patent or publication cited shall not bar the grant of a patent to the applicant, unless the date of such patent or printed publication be more than two years prior to the date on which application was filed in this country."

I also will read into the record a table showing equivalents in pounds and degrees of the various steam pressures and temperatures that have been referred to in this case, the references in some cases being to pounds and in other cases to degrees Fahrenheit, and in others to degrees Centigrade:

PRESSURE-TEMPERATURE EQUIVALENTS OF SATURATED STEAM AT SEA LEVEL

Gauge Pressure Lbs. per Sq. In.	Approximate ° C.	Temperature ° F.
0	100	212
5	109	227
10	115	239
15	121	250

20	125	258
22	127	261
24	129	265
26	131	268
28	133	271
30	134	274
32	136	277
34	138	280
36	139	282
38	140	285
40	141	287.6
42	143	290
44	144	292
46	145	294
48	147	296
50	148	298.4
52	149	300
54	150	302
56	151	304
58	152	305
60	153	307
65	155.5	311.5
70	158	316
75	160	320
80	162	324
85	164	327
90	166	330
95	168	334
100	170	337

I also offer as Plaintiff's Exhibit No. 31 a page from Thorpe's Dictionary of Chemistry, Edition of 1912, an article relating to diamino

guanidines, this being the article which was shown to Mr. Bridgwater in cross-examinaiotn.

PLAINTIFF RESTS.

By Mr. Edmonds:

For the defendant, there were seven depositions from the Aniline case that was stipulated in here. Some of them are very brief, and can be disposed of in a word.

Mr. Kinsman, who worked for the DuPont Company, took the stand and said the DuPont Company had put diphenylguanidine on the market prior to the issuance of this Weiss patent, and that they did it with a knowledge of the Kratz paper, having heard the paper read in 1919. Mr. Morse, an employee of the Atlantic Dyestuffs Company, took the stand and said his company had been preparing to put diphenylguanidine on the market before the issuance of the Weiss patent, and that preparations were complete shortly after the patent issued, and he said in doing so he and his company were familiar with the Kratz paper. As I recall, Mr. Morse said he was at this Philadelphia meeting and heard the paper read. Third, a Mr. Loebenberg testified that he was in the employ of the National Aniline Company, and that it was to him that Weiss came when he solicited employment in March of 1920. He had Weiss make out a formal application blank, a copy of which is in evidence in this record. The point about that is that on the back of it is written the

name of Dr. Kratz, showing that Weiss mentioned Kratz's work on diphenylguanidine in talking with Loebenberg and soliciting employment with the National Aniline Company, and that this witness said that Weiss did not say in the course of his discussion with Loebenberg seeking a job, that he had originated the idea of using diphenylguanidine as an accelerator, but merely that he had done something in the way of devising a process of making diphenylguanidine.

Next there is the deposition of Mr. Shapiro, who was in the employ of the Firestone Rubber Company in March, 1920, at the time when Weiss went there seeking employment. Weiss met this man Shapiro, and in talking with him he said that he had been working on accelerators, and referred to Kratz as having shown the value of diphenylguanidine, and said that he, Weiss, had devised a process of making; that is, in substance, what he wrote on the application blank that Shapiro handed him and told him to fill it in. Shapiro attended this Philadelphia meeting at the instance of the Firestone Company, and heard the Kratz paper and saw the Kratz tables posted on the blackboard, and took copies of the tables, which he took back to the Firestone Company with him. In speaking of the Kratz paper, he said, "Well, it was the first paper which gave us any definite idea of the relative activity of accelerators, and as such was an extremely important paper, because having these relative activities, we were able to apply the various accelerators sensibly. In talking with Shapiro, Weiss never claimed

that he had been the originator of the idea of using diphenylguanidine as an accelerator. Instead, Shapiro said that Weiss said to him, "Of course, you know that diphenylguanidine is a good accelerator, from what you have heard at the Philadelphia meeting." One more point in Shapiro's deposition is that prior to this talk between Shapiro and Weiss, the Firestone Company had been studying the guanidines as possible accelerators of rubber vulcanization. Whether or not that was prompted by Kratz's paper does not appear.

Next is the deposition of Mr. Russell, the man whom Kratz mentioned as his co-worker at the Norwalk Tire & Rubber Company. Russell corroborated Kratz in all respects relating to that work of Kratz at Norwalk. He was Kratz's immediate superior in the Norwalk laboratory. He knew what Kratz was doing, and was familiar with it He identified these records that were put in evidence, as showing Kratz's work at Norwalk. In fact, it was he who got those records from the files of the Norwalk Company and brought them with him and produced them at the trial of the Aniline case. So that he was fully familiar with all of that work, and his testimony corroborates Kratz in all respects.

Next there is a man by the name of Moore, a young chemist just out of college, who entered the employ of the Falls Rubber Company in June, 1917. He was the closest approach to an assistant that Kratz had at that time. He remembered the order for a thousand tubes by the Falls Com-

pany at that time, and filled by the company, and recalled that he had made certain tests on a grey tube rubber compound along in August, 1917, and he produced a test sheet made out by him in his own handwriting, in which the batch that he tested is identified by the same number, T-63, as appears on the Kratz formula for the rubber of those particular tubes. That test, in his handwriting, is in evidence in this case.

Lastly, there is the deposition of Mr. Clark, who appeared here, as I stated at the time he testified, but his testimony was taken over again. He testified that—of course we know that he was in the employ of the Republic Rubber Company. He said that at that time, along in 1917 and 1918, and the early part of 1919, the Republic Company was using thiocarbanilid as its main accelerator, and constructed a plant for the manufacture of thiocarbanilid for its own use. He said that they worked continuously on the development of triphenylguanidine until the latter part of 1919. He said that Daniels went to this Philadelphia meeting, and that was a thing they didn't know very much of, so when Daniels came back he tried to justify the trip, saying he had gained much useful information at the meeting, and Clark said to him specifically, "Did you get the 'dope' on accelerators?" He said, "Well, we are going to work now and produce the real thing." Clark said that thereupon the work on the development of triphenylguanidine stopped abruptly, and from then on the work on accelerators that was done at the Republic plant was

work on the development of diphenylguanidine. One further thing was that he understood it was the invariable rule in the Republic plant that all experiments made by any of the men working in the laboratory should be recorded in the X-book; that that was what the X-book was for; that he had made it his business to issue orders that all experiments be so recorded.

That covers the seven depositions introduced for defendant in, we think, sufficient detail for your Honor's consideration.

Opinion.

Filed February 3, 1926.

GIBSON, *District Judge.*

The plaintiff, Dovan Chemical Corporation, assignee of Morris L. Weiss, has brought its action against the defendant, Corona Cord Tire Company, for alleged infringement of Weiss Patent No. 1,411,231 for a vulcanization accelerator. The application was filed November 12, 1921, and the patent was granted March 28, 1922. The plaintiff prays the ordinary injunction, the delivery to the plaintiff or destruction of disubstituted guanidines (and particularly diphenylguanidine) which defendant may have, and an accounting.

Crude rubber, as such, is of little value. When mixed with sulphur and other materials, and subjected to heat, it becomes the rubber of commerce. This mixture and application of heat is termed vulcanization, and a "vulcanization accelerator" is a

material added to the mixture which not only hastens vulcanization (as its name indicates), but also increases the elasticity and otherwise improves the quality of the rubber article being manufactured. By the patent in suit monopoly in the use of diphenylguanidine and di-substituted guanidines, as such accelerators, is claimed.

The defendant, by stipulation, has admitted the purchase of diphenylguanidine, and use of it in the proportion of two-thirds of 1% of the rubber as an accelerator of vulcanization, but has denied the validity of the patent. It alleges that one Dr. G. D. Kratz, on September 6, 1919, more than two years before the application for the patent in suit, disclosed the subject-matter of the patent in a paper read at a convention of chemists engaged in the rubber industry held at Philadelphia, which paper was printed in the Journal of Industrial and Engineering Chemistry in April, 1920, and that thus the full information of the patent was anticipated. It further declares that Kratz was the discoverer of diphenylguanidine as a vulcanizer accelerator, not Weiss; that tubes made in 1917 by Kratz from a rubber mixture, with that accelerator, were sold; that Weiss was not an originator of the idea of the use of diphenylguanidine as an accelerator, having obtained it from one Baldwin, who had experimented therewith; and finally, that the patent does not disclose a patentable invention.

Plaintiff has particularly relied upon Claims 5, 8, 9 and 12 of the patent, which follow:

> "5. The process of treating rubber or similar materials which comprises combining with

the rubber compound a vulcanizing agent and a di-substituted guanidine accelerator."

* * * * * * *

"8. The process of treating rubber or similar materials, which comprises combining with the rubber compound a vulcanizing agent and diphenylguanidine."

* * * * * * *

"9. A vulcanizing compound of rubber or similar material combined with a vulcanizing agent and a di-substituted guanidine."

* * * * * * *

"12. A vulcanized compound of rubber or similar material combined with a vulcanizing agent and diphenylguanidine."

In view of the stipulated use of diphenylguanidine by the defendant, our inquiry in the instant matter is properly confined to a determination of the validity or invalidity of the 8th and 12th claims.

In discussing them, monophenylguanidine will be abbreviated to MPG, diphenylguanidine to DPG and triphenylguanidine to TPG.

It has been argued by counsel for defendant—and with considerable force—that, no matter who introduced the use of DPG as an accelerator, no patent for such use was an actual invention, or displayed the inventive faculty, when application was made as late as November 12, 1921. The contention is, in substance, that for at least six years prior thereto rubber chemists had accepted the fact that vulcanization accelerators were nitrogen-containing substantees capable of certain reactions in the presence of

sulphur. Among the substances known to meet the general chemical requirements of accelerators in this respect were the guanidines. which included MPG, DPG and TPG. TPG was known to be an accelerator, and was in use as such before the patentee, Morris L. Weiss, began his career as a rubber chemist; and prior to its use the possibility of the guanidines as accelerators had been suggested in magazine articles. DPG is closely related to TPG in chemical construction, and when it was established that the latter was an accelerator of value, it followed as a matter of natural presumption that DPG was also an accelerator. To determine the correctness of this presumption, and the value of the substance, and the best way to use it, the rubber chemist was required, it is claimed, to exercise no inventive faculty, but mere industry in making tests and the ordinary knowledge of his profession. With the knowledge of the fact that one member of a closely related group was an accelerator, the qualities of another member offered no greater problem to the chemist, except in time of solution, than would be offered to a pipe-fitter altering the plumbing in a building. Each would be required to use only the ordinary tools of his trade, the one his ability to prepare and treat a rubber composition, the other his wrench and mechanical ability.

While the contention, just stated, might require careful consideration under some circumstances, we have not based our decision upon it, but have come to the conclusion upon other grounds that the patent in suit is invalid. The testimony, in our judgment, conclusively establishes the fact that Morris L. Weiss was not the inventor or discoverer of the efficacy of

DPG as a vulcanization accelerator—the only actual disclosure of the patent.

It is manifestly impossible that a synopsis of the testimony be here given. Certain admitted facts, as well as disputed testimony, tend strongly to sustain the finding. Morris L. Weiss, having just received a degree in Chemistry from Cooper Union, of New York City, late in 1917, entered the employ of The Republic Rubber Company, of Youngstown, Ohio. That company was engaged in the manufacture of rubber articles largely made from "shoddy", or reclaimed rubber. Like most other rubber manufacturers, in 1918-19 it was interested in obtaining other and improved accelerators, but was specially interested in TPG, and was engaged in building a plant for its commercial use. Weiss, in addition to his usual work, was engaged in experiments upon accelerators, among them TPG. He was required by the rules of the Company to enter all his experiments in a book, called the "X Book" kept for the purpose. During the term of Weiss' employment, prior to September 7, 1919, this X Book shows two experiments with DPG as an accelerator, which are undisputed, and a third which shows a change of its original date and which defendant claims was subsequent to that date. The undisputed tests were with a "shoddy" mixture, and show no marked superiority of DPG over TPG. The disputed test was not with the shoddy stock of the company, and showed a considerable and marked superiority. On September 6, 1919, one Dr. G. D. Kratz, with a chemistry degree from Cornell University, read a paper upon accelerators before the American Chemical Society at Philadelphia. In it he fully disclosed

the subject-matter of the Weiss patent, more fully, indeed, than does the patent. *Inter alia,* he placed a table upon a blackboard, giving the comparative powers of DPG, TPG and other accelerators, aniline being the basis of the comparison. The immediate superior of Weiss in the Republic Rubber Company, M. H. Daniels, was present when this paper was read and copied the tables placed upon the blackboard; and this information was imparted to Weiss upon the following day. After this date the "X Book" shows the use of DPG in a number of tests. In March, 1920, Weiss was discharged by the Republic Rubber Company, and very shortly thereafter applied for employment to two other rubber manufacturers. In both his written applications he referred to the paper read by Dr. Kratz as showing the value of DPG as an accelerator, and stated that he had devised a method of manufacturing that substance cheaply; but in neither did he claim to have been the original discoverer of it as an accelerator. Later in 1920, Weiss with others organized the plaintiff company. On July 2, 1921, Weiss made application for a patent to cover his method of preparation of DPG, and received it on July 11, 1922. As stated, the application for the present patent was filed November 12, 1921, and the patent issued March 28, 1922. The patent examiner cited Dr. Kratz's paper before the Chemical Society, published in a magazine in April of 1920, as an anticipation of the patent. Upon affidavits being furnished by Weiss to sustain a claim that he had discovered the qualities of DPG as an accelerator prior to the Kratz paper, the patent eventually was issued. The proceeding in the Patent Office was entirely *ex parte,* and

no testimony was introduced to show any discovery by Kratz prior to the reading of his paper. It will be noted, also, that the patentee accepted the Kratz paper as a disclosure of the invention claimed in his patent and sought to show the priority of his own discovery, while in the instant case the plaintiff questions the sufficiency of the paper as a disclosure.

The patentee, Weiss, has testified that he began to investigate DPG early in 1918 and made a number of tests with it prior to February of 1919. Despite the rule that all tests should be recorded in the "X Book", no test of DPG appears therein prior to February, 1919, except one by Weiss' predecessor, Baldwin, in 1917. Three tests appear under dates of the early part of the year 1919. Of these, two are in connection with shoddy compounds, and were of little significance. The other now appears of the date "2-10-19." A casual examination discloses that the month has been changed; and an examination under a strong glass plainly shows that the "2" was originally "9", thus making the original date September 10, 1919, three days after Kratz's table of accelerators had been given to Weiss. This test was with new rubber, and not with shoddy, the ordinary stock of the plant. This has some slight significance in itself. Weiss in his testimony refers to this test as the first successful experiment with DPG.

After the meeting of the Chemical Society and the reading of the Kratz paper, a number of tests appear. Some of them are undated, it is true, and Weiss claims they were made in the Summer of 1919. Since they follow tests dated in October of 1919, and precede other tests dated in October, November and

December, it is impossible to accept his testimony in this respect.

The testimony of Weiss has been supported by other witnesses in the plant. Their testimony is intended to establish completion of the discovery of DPG prior to Dr. Kratz's paper on September 6, 1919. Chief of these witnesses was M. H. Daniels, the immediate superior of Weiss in the Republic Rubber Company. He has testified that Weiss discussed DPG with him early in 1918, and that he had knowledge that thereafter tests were being made of the substance. His exact knowledge of the progress of this investigation at any particular stage is by no means made plain by his testimony. Daniels attended the Chemical Society meeting at which the Kratz paper was read. Upon his return he delivered his notes of the Kratz paper to Weiss, and now alleges that he told Weiss that the paper confirmed their own findings as to DPG. But the exact nature of these findings does not clearly appear. That a complete discovery of the qualities of DPG had then been made, seems impossible under the surrounding circumstances. The test book actually showed only two inconclusive tests by Weiss. The Company during 1919 was mainly interested in TPG as an accelerator and was constructing a plant to manufacture it commercially; and it was investigating TPG as late as December 1, 1919, when Daniels wrote to one Stevens, a chemist of the Company, that he (Stevens) was spending "too much time on triphenyl. • • • Diphenyl is King pin now." The tests of DPG, subsequent to Kratz's paper, which were recorded, were quite numerous; but even so, the results were never im-

parted to the superior officer of Daniels, according to his testimony. (see Clark, p. .....). Daniels has stated that he did impart information of the investigation to Mr. Clark in the summer of 1919, but that he also said: "I wasn't prepared to say how good it was." Still more convincing of the unreliability of the claim of complete discovery prior to September 6, 1919, is the admitted fact that the Republic Rubber Company never used DPG in the manufacture of any goods prior to the departure of Weiss on March 1, 1920. If a complete discovery of the powers of DPG had been made by Weiss, and was known to Daniels, it is almost inconceivable that not one trial of it should be made in actual manufacture.

In addition to these side-lights on the testimony of Weiss and his supporting witness, Daniels, the testimony discloses certain other matters that materially affect the weight of their testimony. Despite the fact that the Republic Rubber Company never used DPG in making any articles, Daniels, in support of the patent application, made an affidavit wherein he stated:

> "These tests were also carried out in the compounding laboratory for the various departments of the Republic Rubber Company at Youngstown, Ohio, and the accelerator proved to be highly efficient as an accelerator in the actual vulcanization of rubber goods, such as hose, tires, belts, valves and other mechanical goods."

The manifest effect of the immediately foregoing was, at best, to create a false impression. In the same affidavit, a certain undated memorandum of test (copy

attached to affidavit) was alleged to have been made "early in the year 1919." Daniels, in the instant case, said the entry was made late in the year 1919 or early in the year 1920. The context plainly shows the entry was not made early in 1919. This was a vital matter before the Patent Examiner, and whether such inaccuracies of statement are the result of carelessness or otherwise, the effect of them is to seriously affect the credit to be given the whole testimony.

Weiss' testimony in the instant case shows various contradictions of statements made in prior steps in the case, some in regard to material matters. Mere variation in recollection at different times is not always vital; but when by means of the variations the testimony becomes more favorable to the contentions of the witness with each successive delivery, the Court is required to scrutinize it with some care.

Certain other witnesses have been produced on behalf of the plaintiff. They were employees within the plant of the Republic Rubber Company, connected with the chemists only in the handling of tests. Having kept no records, and being unacquainted with the accelerator in the mix handled, it is not probable they would remember exact dates at the end of seven years. We feel that the circumstances, as well as our observation of the witnesses, preclude us from giving great weight in the attempt to fix Weiss' discovery of DPG as prior to Kratz's disclosure.

The credible testimony shows that prior to September 7, 1919, the patentee, Weiss, made several tests with DPG; but those tests were so few in number and so inconclusive in results that no legitimate claim can be made to a knowledge of the superiority of

DPG over TPG as an accelerator. We find as a fact, therefore, that Morris L. Weiss did not independently discover the efficacy of DPG as an accelerator of vulcanization prior to the delivery of the Kratz paper on September 6, 1919, But even had our finding in this respect been otherwise, the testimony discloses that not only had another disclosed the subject-matter of the patent to the world in advance of the patentee, but that other had also discovered the qualities of, and had used DPG several years prior to the time claimed by the patentee as marking the beginning of his investigations.

In 1916, G. D. Kratz was a research chemist for the Norwalk Tire & Rubber Company. He had a degree in chemistry from Cornell University, and had been a rubber chemist for four years in 1916. In that year he prepared a quantity of DPG and established its efficacy as an accelerator by a number of tests. His investigation included a number of other accelerators, and a table was prepared by him which showed the comparative powers of the accelerators investigated. In this respect, his accomplishment was greater than that claimed by the patentee. While Kratz was engaged in this labor, his associates, Drs. Russell and Spence, were in touch with his work. They have testified to that labor and its results. As further confirmation a copy of Kratz's report to the Norwalk Company has been offered. In 1917 Kratz became Chief Chemist of the Falls Rubber Company. In 1917, he has testified, he used DPG in the manufacture of 300 tires, part of a consignment of 1000 tires sold. In 1918, Kratz repeated his tests of the various accelerators tested

in 1916 at Norwalk. His reason for so doing was his desire to verify the previous results in a rubber compound which did not contain zinc oxide, that material having been a part of the compound when the 1916 tests were made. These tests, with other labor necessary, furnished the foundation facts of the paper read September 6, 1919, and published in April of 1920. It has been urged by counsel for the plaintiff that the testimony of Kratz as to the actual use of DPG in the manufacture of tires should be ignored, because uncorrobroated, and points to the ignorance of subordinate employees of the Falls Rubber Company. There is some documentary evidence which tends to confirm this claim of use, but even if there were none we should not feel justified in rejecting it. To do so would be to impute wilful falsehood to Dr. Kratz, and neither his interest in this case nor his manner and appearance upon the stand was such as to furnish any foundation for that imputation. His knowledge of DPG and the general circumstances make the use of it as an accelerator quite probable.

It is further argued that Kratz's early investigations and discoveries were nothing more than abandoned experiments. The foundation of this claim seems to be based upon the misapprehension that no use of the idea other than actual manufacture or an application for a patent is an actual disclosure of it to the world and a reduction to practice. As a matter of fact the method of disclosure adopted by Kratz called the attention of rubber manufacturers to the discovery far more effectively than would have a patent application quietly filed in the Patent Office,

As to what constitutes reduction to practice, see *Curtiss vs. Janin,* 278 Fed. Rep., 454. Nor is the claim of abandonment to be established by pointing to the fact that no use of DPG followed Dr. Kratz's disclosure. In making use of such an argument counsel for plaintiff is attempting to bring the subject matter of this patent, to which plaintiff is not entitled, within the scope of another patent which does belong to it so far as the evidence of this case discloses. DPG was not used by rubber manufacturers after the Kratz disclosure, not because its efficacy was unknown or doubted, but because no method was known for its cheap manufacture. Weiss devised a method which made possible its commercial use, and, so far as appears, accomplished something of great value. He filed an application for a patent upon this method some five months prior to his application for the patent in the instant case, and eventually was granted it. But disclosure of a method of cheap manufacture does not entitle a patentee to claim a monopoly in the use of an article whose qualities were disclosed by another. Commericial use is one thing, discovery another, although, it is true, such use may, under certain circumstances, throw light upon the novelty claimed for a patented device. Those reasons do not exist here, where the reason for non-use prior to plaintiff's method patent fully appears.

In reaching our conclusion that Morris L. Weiss was not the actual and independent inventor and discoverer of DPG as an accelerator, we have endeavored to consider the questions involved without being unduly affected by the action of other Courts in litigation upon the patent in suit; and, owing to the differ-

ence in opinion in such Courts, we trust we have been able to do so.

Let a decree be drawn in accordance with the finding of above opinion.

Final Decree.

Filed February 13, 1926.

This cause having come on for trial on October 7, 1925, Now, after hearing James J. Kennedy, Esq., in behalf of the plaintiff, and Dean S. Edmonds, Esq., in behalf of the defendant, and the cause having been considered by the Court and an opinion having been filed herein on the 3rd day of February, 1926, it is hereby

Ordered, Adjudged and Decreed that Letters Patent of the United States No. 1,411,231, granted to the plaintiff as assignee of Morris L. Weiss, for Vulcanization Accelerator, are invalid and that the Bill of Complaint herein be, and the same is hereby dismissed with costs to the defendant to be taxed.

ROBERT M. GIBSON,
United States District Judge.

Approved as to form.

J. S. WOOSTER,
Counsel for Plaintiff.

Dated Feb. 10, 1926.

Petition for Appeal.

The above named, Dovan Chemical Corporation, the plaintiff, conceiving itself aggrieved by the decree rendered and entered in the above entitled cause on the 13th day of February, 1926, hereby appeals from said decree to the United States Circuit Court of Appeals for the Third Circuit, for the reasons set forth in the Assignment of Errors filed herewith, and prays that its appeal be allowed, that citation be issued as provided by law, that a transcript of the record, proceedings, evidence, papers and exhibits, and a copy of the opinion of this court filed in this cause, upon which said decree was based, duly authenticated by the Clerk of the Court, be transmitted to the United States Circuit Court of Appeals for the Third Circuit, under the rules in such cases made and provided.

DOVAN CHEMICAL CORPORATION,

By BYRNES, STEBBINS & PARMELEE,
Solicitors.

Dated: March 10, 1926.

Order Allowing Appeal.

On motion of Byrnes, Stebbins & Parmelee, solicitors for plaintiff, it is hereby

ORDERED

That an appeal to the United States Circuit Court of Appeals for the Third Circuit from the decree heretofore filed and entered herein, be, and the same is hereby, allowed; and that a certified transcript of the record, proceedings, evidence, papers and exhibits, and a copy of the opinion of this court filed in this cause upon which said decree was made and entered herein, be duly authenticated by the Clerk of this Court and be forthwith transmitted to said United States Circuit Court of Appeals for the Third Circuit, and that Citation issue to Corona Cord Tire Company, the defendant herein.

ROBERT M. GIBSON,
United States District Judge.

Dated: March 10, 1926.

Citation on Appeal.

United States of America, ss: to Corona Cord Tire Company,

Greeting:

You are hereby cited and admonished to be and appear before the United States Circuit Court of Appeals for the Third Circuit, in the City of Philadelphia, on the 11th day of October, 1926, pursuant to an appeal filed in the Clerk's office for the District Court of the United States of America for the Western District of Pennsylvania, wherein Dovan Chemical Corporation is appellant and you are appellee, to show cause, if any there be, why the decree in said appeal mentioned should not be corrected and why speedy justice should not be done to the parties in that behalf.

Given under my hand at the City of Pittsburgh, in the Circuit above named, on the 11th day of March, in the year of our Lord One Thousand Nine Hundred and Twenty-six.

ROBERT M. GIBSON,
United States District Judge.

Stipulation.

The plaintiff having taken an appeal from the final decree in the above-entitled suit, it is stipulated and agreed, with the approval of the Court, that the entire testimony taken at the trial in the form of questions and answers shall be used in making the appeal record.

BYRNES, STEBBINS & PARMELEE,
Solicitors for Plaintiff.

WINTER, BROWN & CRITCHLOW,
Solicitors for Defendant.

Approved:
JOSEPH BUFFINGTON,
United States Circuit Judge.

Pittsburgh, Pa.,
March 12, 1926.

Bond.

Know all men by these presents that we, DOVAN CHEMICAL CORPORATION of New York, New York, as principal, and UNION INDEMNITY COMPANY, a corporation of Louisiana, having an office at 1006 Keystone Building, Pittsburgh, Pennsylvania, as surety, are held and firmly bound unto Corona Cord Tire Company in the sum of One Thousand Dollars ($1,000.00), to the full and lawful payment of which, well and truly to be made, we do hereby bind ourselves, our successors and legal representatives and assigns, jointly and severally, by these presents.

In Testimony Whereof the said DOVAN CHEMICAL CORPORATION, by its President, and the said UNION INDEMNITY COMPANY, by E. W. Murphy, its agent and attorney in fact, have executed this instrument this 4th day of March, 1926.

Whereas, lately the United States District Court for the Western District of Pennsylvania, in a suit brought by the said DOVAN CHEMICAL CORPORATION against the said Corona Cord Tire Company a decree was entered dismissing the bill of complaint of the said DOVAN CHEMICAL CORPORATION, and the said DOVAN CHEMICAL CORPORATION proposes to appeal from said decree to the United States Circuit Court of Appeals for the Third Circuit.

Now, Therefore, the condition of this obligation is such that if the said DOVAN CHEMICAL CORPORATION shall mainatin its said appeal, or shall satisfy all costs in case of its failure so to do, this obligation shall be void; otherwise to be and remain in full force and effect.

DOVAN CHEMICAL CORPORATION,
By H. S. DOTY,
President.

UNION INDEMNITY COMPANY,
By E. W. MURPHY,
Attorney in Fact.

Pittsburgh, Pa.,
March 10th, 1926.

Assignment of Errors.

Now comes Dovan Chemical Corporation, the plaintiff in the above entitled cause, and files the following assignment of errors upon which it will rely upon the prosecution of the appeal herein from the decree made by this honorable court on the 13th day of February, 1926.

I.

That the Court erred in holding that the Letters Patent in suit No. 1,411,231 are invalid.

II.

That the Court erred in not holding that the said Morris L. Weiss was the first, true, original and sole inventor of the invention described in said Letters Patent No. 1,411,231 and claimed in claims 5, 8, 9 and 12 thereof.

III.

That the Court erred in not holding that the subject-matter described in said Letters Patent No. 1,411,231 constitutes a patentable discovery.

IV.

That the Court erred in not ordering an injunction against the defendant enjoining and restraining it from infringing the patent in suit by making, using, or selling any substituted guanidine and particularly diphenylguanidine for use as a vulcanizing accelerator, or vulcanizing or vulcanized compounds of rubber or similar material combined therewith; and from prac-

ticing the process of treating rubber or similar materials with such vulcanizing accelerator.

V.

That the Court erred in not adjudging and decreeing that the plaintiff is entitled to an accounting against the defendant for profits and damages growing out of the infringement of said Letters Patent No. 1,411,231.

VI.

That the Court erred in holding that the Weiss test dated "2-10-19" was in fact made in "9-10-19"; and that examination under a strong glass plainly shows that "2" was originally "9."

VII.

That the Court erred in holding that the undisputed Weiss tests of February and March, 1919, show no marked superiority of diphenylguanidine over triphenylguanidine.

VIII.

That the Court erred in holding that the Kratz lecture of September 6, 1919, and paper of April, 1920, more fully disclosed the subject-matter of the Weiss Patent No. 1,411,231 than does the patent itself.

IX.

That the Court erred in holding that the table placed by Kratz upon a blackboard gave or correctly gave the comparative powers of diphenylguanidine, triphenylguanidine and other accelerators relatively to aniline as the basis of comparison.

X.

That the Court erred in holding that Weiss in his written applications for employment acknowledged the paper read by Dr. Kratz as showing the superior value of diphenylguanidine as an accelerator.

XI.

That the Court erred in holding that in making such applications for employment Weiss did not claim to have been the original discoverer of diphenylguanidine as an accelerator; or in holding that failure so to assert at such times was prejudicial.

XII.

That the Court erred in giving weight to the alleged test by Baldwin in 1917 and in implying thereby that Weiss was not an original inventor and derived his conception from Baldwin.

XIII.

That the Court erred in rejecting Weiss' tests made in the summer of 1919 because of following certain tests dated in October, 1919, and preceding other tests dated in October, November and December, 1919.

XIV.

That the Court erred in holding that the test-book actually showed only inconclusive tests by Weiss prior to September 6, 1919, and that the tests shown were inconclusive.

XV.

That the Court erred in holding that Weiss' testimony in the instant case shows various contradictions in regard to material matters made in prior statements.

XVI.

That the Court erred in finding as a fact that Morris L. Weiss did not independently discover the efficacy of diphenylguanidine as an accelerator of vulcanization prior to the delivery of the Kratz paper in September 6, 1919.

XVII.

That the Court erred in holding that Kratz had discovered the qualities of, and had used, diphenylguanidine several years prior to the entry of Weiss into the field.

XVIII.

That the Court erred in holding that Kratz in 1916 had established the efficacy of diphenylguanidine as an accelerator of vulcanization by a number of tests.

XIX.

That the Court erred in holding that Kratz in 1916 prepared a table which showed the comparative powers of the accelerators investigated.

XX.

That the Court erred in holding that Kratz in 1917 used diphenylguanidine in the manufacture of 300 tires, being part of a consignment of 1,000 tires sold.

XXI.

That the Court erred in holding that in 1918 Kratz repeated his tests of 1916 with zinc oxide, and that such tests, with other labor necessary, furnished the foundation facts of the paper read on September 6, 1919, and published in April of 1920.

XXII.

That the Court erred in holding that there is documentary evidence which tends to confirm the claim by Kratz of use of diphenylguanidine in tires in 1918.

XXIII.

That the Court erred in holding that the general circumstances make the use of diphenylguanidine as an accelerator by Kratz in tires sold by Falls Rubber Company in 1918 "quite probable."

XXIV.

That the Court erred in holding that Kratz' lecture, or paper, called the attention of rubber manufacturers to the discovery of diphenylguanidine as a rubber accelerator, and did so far more effectively than would have a patent application quietly filed in the Patent Office.

XXV.

That the Court erred in not holding that Kratz' work prior to September 6, 1919, was an abandoned experiment.

XXVI.

That the Court erred in not holding that Weiss was exercising due diligence at and before September 6, 1919.

XXVII.

That the Court erred in holding that diphenylguanidine did not come into public use because no method was known for its cheap manufacture.

XXVIII.

That the Court erred in not adjudging and decreeing that plaintiff recover of defendant the costs and disbursements incurred by the plaintiff, or any costs.

WHEREFORE, this appellant, Dovan Chemical Corporation, prays that the decree of the District Court of the United States for the Western District of Pennsylvania may be reversed in respect to the matters herein complained of, and that a decree be entered pursuant to the prayer of the bill of complaint.

DOVAN CHEMICAL CORPORATION,
By BYRNES, STEBBINS & PARMELEE,
Solicitors.

Dated: March 10th, 1926.

Praecipe on Appeal.

To the Clerk of the United States District Court:

In accordance with the provisions of section (a) under rule No. 75, you are hereby respectfully requested to prepare and forward to the Clerk of the United States Circuit Court of Appeals for the Third Circuit a transcript of the record in the above entitled cause for use in connection with the appeal from the decree of this Court, which said transcript is to be filed in the office of the Clerk of the United States Circuit Court of Appeals for the Third Circuit under the appeal heretofore perfected. Please include in said transcript the following pleadings, proceedings, papers on file and exhibits, to wit:

Docket Entries.
Bill of Complaint.
Answer.
Opening Statements of Counsel.
Plaintiff's Testimony.
Defendant's Testimony.
Rebuttal Testimony.
Surrebuttal Testimony.
Opinion of the District Court.
Final Decree.
Petition for Appeal.
Assignment of Errors.
Order Allowing Appeal.
Bond on Appeal.

Plaintiff's paper exhibits to be reproduced for the transcript:

Plf. Exh. No. 1, Copy of Patent in Suit.

Plf. Exh. No. 2, 2000 X-book (for identification), page 91.

Plf. Exh. No. 4, Contract between Doty & Woodward and Weiss.

Plf. Exh. No. 5, Formula of YME of Weiss.

Plf. Exh. No. 6, X-book 1700 (for identification).

Plf. Exh. No. 7, Page X-1764.

Plf. Exh. No. 8, Page X-1773.

Plf. Exh. No. 9, Page X-1777.

Plf. Exh. No. 10, X-2000 to X-2074.

Plf. Exh. No. 11, Paper from India Rubber World, July, 1921 (marked for identification, page 401).

Plf. Exh. No. 13, Formula of T-8.

Plf. Exh. No. 14, Carlton affidavit.

Plf. Exh. No. 17, Williams' article on Report, Sept. 8, 1919. Philadelphia meeting of American Chemical Society.

Plf. Exh. No. 19, Photostatic copy American Chemical Society Journal, page 221. Preparation of Monophenylguanidine.

Plf. Exh. No. 20, Chart of Tables 1 and 4, Kratz paper.

Plf. Exh. No. 21, Whitby chart showing effect of substitution.

Plf. Exh. No. 22, Chart by Doty.

Plf. Exh. No. 23, India Rubber World of 1919, pages 137 to 140, article by D. F. Cranor.

Plff. Exh. No. 24, Patent to Kratz 1,428,040.

Plf. Exh. No. 25, Rubber Age, February 25, 1921, pages 401 to 403, article by Kratz and Shapiro.

Plf. Exh. No. 26, Paper by W. M. Ames in Journal of Society of Chemical Industry, Apr. 25, 1921, pages 117 T and 125 T.

Plf. Exh. No. 27, India Rubber World of July 1, 1921, p. 744, article relating to Excello.

Plf. Exh. No. 28, Photostat of pages 283 and 284 of Berichte of 1905, Vol. 38, Sec. 53, article by Pellizarri and Cantoni.

Plf. Ex. No. 29, Weber Article.

Plf. Exh. No. 30, Weiss Application, Serial No. 490746.

Plf. Exh. No. 31, Thorpe Article.

Plaintiff's physical exhibits and others which are not to be reproduced, but which are to be treated as physical exhibits:

Plf. Exh. No. 3, Samples of Weiss reports 1919.

Plf. Exh. No. 12, Page from Thorp's dictionary, 1912 edition, defining diaminoguanidine (marked for identification, page 524).

Plf. Exh. No. 15, Tariff Commission report, 1923.

Plf. Exh. No. 16, Tariff Commission report, 1924.

Plf. Exh. No. 18, Graduated bottle of diphenylguanidine.

Defendant's paper exhibits to be reproduced for the transcript:

Dft. Exh. "A," Weiss affidavit.

Dft. Exh. "B," Application of Weiss to National Aniline Company.

Dft. Exh. "C," Application of Weiss to Firestone Company.

Dft. Exh. "E," Paper by Kratz, Flower and Coolidge.

Dft. Exh. "F," Letter from Daniels to Stevens.

Dft. Exh. "G," Dovan Chemical Corporation Circular.

Dft. Exh. "H," File Wrapper of patent in suit.

Dft. Exh. "K," Copy of Chemical & Metallurgical Engineering for Oct. 1, 1919.

Dft. Exh. "L," Pages from Metallurgical & Chemical Engineering, Sept. 1, 1916.

Dft. Exh. "M," Copy of pages 782 to 789 of Journal of Society of Chemical Industry for July 31, 1917.

Dft. Exh. "N," Article "The Rubber World" for May 1, 1921, pages 572 and 573.

Dft. Exh. "O," Translation of article in French magazine.

Dft. Exh. "P," Kratz cards.

Dft. Exh. "Q," Second group of Kratz cards.

Dft. Exh. "R," Norwalk report by Dr. Kratz.

Dft. Exh. "S," Laboratory Sheet—Dr. Kratz.

Dft. Exh. "T," Three sheets identified by Kratz.

Dft. Exh. "U," Kratz test sheet.

Dft. Exh. "X," Cards containing formula for above tubes.

Dft. Exh. "AA," Photograph of page of X-book.

Dft. Exh. "BB," Photograph of page of X-book.

Dft. Exh. "CC," Photograph of page of X-book.

Dft. Exh. "DD," Unmutilated print of Herring.

Dft. Exh. "DD-1," Two cards attached to above print.

Dft. Exh. "GG," Records of Bridgwater Tests.

Dft. Exh. "HH," Test sheets of Witness Bridgwater.

Dft. Exh. "II," Test sheets of Witness Bridgwater.

Dft. Exh. "MM," Test sheets of Witness Bridgwater.

Dft. Exh. "NN," Chart showing formula for disubstituted guanidine.

Dft. Exh. "OO," Hoffman patent No. 1,126,469.

Dft. Exh. "PP," Article by Peachey.

Dft. Exh. "RR," Article by Twiss and Brazier.

Dft. Exh. "SS," Sheet recording tests of Sanderson.

Dft. Exh. "UU," Daniels deposition in Dovan vs. National.

Dft. Exh. "QQ," Weiss patent 1,422,506.

Dft. Exh. "QQ[1]," Sheet of chemical formula.

Dft. Exh. "WW," Carlton affidavit.

Defendant's physical exhibits and others which are not to be reproduced, but which are to be treated as physical exhibits:

Dft. Exh. "D," Weiss brief in Interference proceeding.

Dft. Exh. "I," Stipulation covering items of proof.

Dft. Exh. "V," Inner tube made at Falls Rubber Co. (With D. P. G.)

Dft. Exh. "W," Inner tube made at Falls Rubber Co. (without D. P. G.).

Dft. Exh. "EE," Cut-out prints by Herring.

Dft. Exh. "FF," Barrows letter (offered and withdrawn).

Dft. Exh. "QQ[2]," Article by King, Sept. 1, 1916 (same as Ex. "L").

Dft. Exh. "TT," Rubber slabs of Sanderson.

Dft. Exh. "VV", Record of Scott vs. Weiss vs. Heuser.

Dft. Exh. "YY," Bottle of white powder.
Copy of this Praecipe.

BYRNES, STEBBINS & PARMELEE,
Solicitors for Dovan Chemical Corporation.

Service of a copy of the above praecipe is acknowledged this 13th day of March, 1926.

WINTER, BROWN & CRITCHLOW,
Solicitors for Corona Cord Tire Company.

Certificate.

I, J. Wood Clark, Clerk of the District Court of the United States, for the Western District of Pennsylvania, do hereby certify that the annexed and foregoing pages contain a true and correct copy of the record on appeal in the above entitled case, so full and entire as the same remains of record and on file in my office, in the City of Pittsburgh, in said District.

IN TESTIMONY WHEREOF, I have hereunto signed my name and affixed the seal of the said Court, at Pittsburgh, this ..... day of ....., A. D. 1926.

J. WOOD CLARK,
Clerk.